

**REGULATORY IMPACT REVIEW****CHAPTER 10**

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**10.1 INTRODUCTION**

This Regulatory Impact Review (RIR) evaluates proposed measures modifying the Atlantic Large Whale Take Reduction Plan (ALWTRP). The ALWTRP imposes commercial fishing gear restrictions and other requirements focused on reducing entanglement of large whale species. Actions taken to amend fisheries management plans or implement other regulations governing U.S. fisheries must meet a variety of Federal laws and regulations. Among these is Executive Order 12866, which states the following:

In deciding whether and how to regulate, agencies should assess all costs and benefits of available regulatory alternatives, including the alternative of not regulating. Costs and benefits shall be understood to include both quantifiable measures (to the fullest extent that these can be usefully estimated) and qualitative measures of costs and benefits that are difficult to quantify, but nevertheless essential to consider. Further, in choosing among alternative regulatory approaches, agencies should select those approaches that maximize net benefits (including potential economic, environment, public health and safety, and other advantages; distributive impacts; and equity), unless a statute requires another regulatory approach.

In addition, NMFS requires an RIR for all regulatory actions that are of public interest.

**10.2 OBJECTIVES AND LEGAL BASIS OF PROPOSED REGULATIONS**

The purpose of the proposed revisions to the ALWTRP is to provide for the conservation and protection of Atlantic large whales -- North Atlantic right whales (*Eubalaena glacialis*), North Atlantic humpback whales (*Megaptera novaeangliae*), and fin whales (*Balaenoptera physalus*) -- thereby fulfilling NMFS' obligations under the Endangered Species Act (ESA) and the Marine Mammal Protection Act (MMPA). The need for the proposed revisions is demonstrated by the continuing risk of serious injury and mortality of Atlantic large whales due to entanglement in commercial fishing gear.

The MMPA of 1972 provides protection for species or stocks that are, or may be, in danger of extinction or depletion as a result of man's activities. The MMPA states that measures should be taken immediately to replenish the population of any marine mammal species or stock that has diminished below its optimum sustainable level. With respect to any stock or species, the "optimum sustainable population" is the number of animals that will result in the maximum productivity of the stock or species, keeping in mind the carrying capacity of the habitat and the health of the ecosystem of which they form a constituent element.

Under the MMPA, the Secretary of Commerce is responsible for the conservation and management of pinnipeds (other than walruses) and cetaceans (aquatic mammals, including whales). The Secretary of Commerce has delegated MMPA authority to the National Marine Fisheries Service (NMFS).

In 1994, Congress amended the MMPA, establishing new provisions to govern the taking of marine mammals incidental to commercial fishing operations.<sup>1</sup> These new provisions include the preparation of stock assessments for all marine mammal stocks in waters under U.S. jurisdiction, and development and implementation of take reduction plans for stocks that may be reduced or are being maintained below their optimum sustainable population levels due to interactions with commercial fisheries.

Take reduction plans are required for all "strategic stocks." Under the MMPA, a "strategic stock" is a stock: (1) for which the level of direct human-caused mortality exceeds the Potential Biological Removal (PBR) level;<sup>2</sup> (2) that is declining and is likely to be listed under the Endangered Species Act (ESA) in the foreseeable future; or (3) that is listed as a threatened or endangered species under the ESA or as a depleted species under the MMPA. The immediate goal of a take reduction plan is to reduce, within six months of its implementation, the mortality and serious injury of strategic stocks incidentally taken in the course of U.S. commercial fishing operations to below the PBR levels established for such stocks. The long-term goal of a take reduction plan is to reduce, within five years of its implementation, the incidental mortality and serious injury of strategic marine mammals taken in the course of commercial fishing operations to insignificant levels approaching a zero mortality and serious injury rate, taking into account the economics of the fishery, the availability of existing technology, and existing state or regional fishery management plans.

Right whales, humpback whales, and fin whales are listed as endangered species under the ESA, and are thus considered strategic stocks under the MMPA. In response to its obligations under the MMPA, NMFS established the Atlantic Large Whale Take

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<sup>1</sup> As defined in the MMPA, the term "take" means to harass, hunt, capture, or kill, or attempt to harass, hunt, capture, or kill any marine mammal.

<sup>2</sup> The Potential Biological Removal (PBR) level is defined in the MMPA as the maximum number of animals, not including natural mortalities, that may be removed from a marine mammal stock annually while allowing that stock to reach or maintain its optimum sustainable population. The parameters for calculating the PBR level are described in the MMPA.

Reduction Team (ALWTRT) in 1996 to develop a plan for reducing the incidental take of large whales in commercial fisheries along the Atlantic Coast. The ALWTRT consists of representatives from the fishing industry, state and Federal resource management agencies, the scientific community, and conservation organizations. The purpose of the ALWTRT is to provide guidance to NMFS in developing and amending the Atlantic Large Whale Take Reduction Plan to meet the goals of the MMPA with respect to Atlantic large whales.

In addition, the Endangered Species Act (ESA) provides for the conservation of species that are in danger of extinction throughout all or a significant portion of their range and the conservation of the ecosystems on which they depend.<sup>3</sup> The right whale, humpback whale, and fin whale species are all federally listed as endangered and are therefore subject to protection under the ESA.

Section 7 of the ESA directs all Federal agencies to use their existing authorities to conserve threatened and endangered species and to ensure that their actions do not jeopardize listed species or destroy or adversely modify critical habitat. When a proposed Federal action may affect an ESA-listed marine species, Section 7 directs that the "Action agency" consult with the Secretary of Commerce; this is referred to as a Section 7 consultation.<sup>4,5</sup>

To assess impacts on large whale and sea turtle species protected under the ESA, NMFS has prepared Biological Opinions for the continued authorization of Federal fisheries under the Fishery Management Plans for the multispecies, spiny dogfish, and monkfish fisheries, and under Federal regulations for the lobster fishery, amongst others. Section 7 consultations were first initiated for each of these fisheries either at the time that the Fishery Management Plan was created to manage the fishery or, in the case of lobster, at the time of a significant amendment (Amendment 5) to the Federal Lobster Management Plan. The Northeast multispecies fishery has a long consultation history, including formal and informal Section 7 consultations, beginning with a formal consultation initiated on June 12, 1986. Formal consultation was first initiated for spiny dogfish on August 13, 1999; for monkfish on December 21, 1998; and for lobster on March 23, 1994. Subsequent ESA Section 7 consultations on those fisheries incorporated the ALWTRP as a Reasonable and Prudent Alternative to avoid jeopardy to right whales. NMFS reinitiated consultation on May 4, 2000, for the multispecies, spiny dogfish and monkfish gillnet fisheries, and on June 22, 2000, for the lobster fishery, following new whale entanglements resulting in serious injuries to right whales, at least one right whale mortality in gillnet gear, new information indicating a declining status for western North Atlantic right whales, and revisions to the ALWTRP.

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<sup>3</sup> "Species," as defined by the Act, includes any subspecies of fish, wildlife, or plant and any distinct population segment of any vertebrate species which interbreeds when mature.

<sup>4</sup> The "Action agency" is the Federal agency charged with permitting, conducting or funding the proposed activity serving as the basis for the consultation.

<sup>5</sup> Federal agencies must consult with the Secretary of the Interior when a proposed action may affect an ESA-listed species under the Department of Interior's purview.

The Biological Opinions from the May/June 2000 Section 7 consultations, finalized June 14, 2001, found that NMFS' administration of these Federal fisheries, as modified by the ALWTRP requirements in effect at that time, was likely to jeopardize the continued existence of the western North Atlantic right whale. The Biological Opinions identified a set of Reasonable and Prudent Alternatives designed to avoid the likelihood of jeopardy to right whales. These measures included:

- Seasonal Area Management (SAM);
- Dynamic Area Management (DAM);
- An expansion of gillnet gear modification requirements and restrictions to Mid-Atlantic waters and modification of fishing practices in Southeastern waters;
- Continued gear research and modifications; and
- Additional measures that implement and monitor effectiveness of the Reasonable and Prudent Alternatives.

These measures were intended, in combination, to reduce the risk of serious injury and mortality to large whales from entanglements in commercial fishing gear and minimize adverse impacts if entanglements occur.

### 10.3 PROBLEM ADDRESSED BY ALWTRP

Right whales, humpback whales, and fin whales are listed as endangered species under the ESA, and are thus considered strategic stocks under the MMPA. In addition, although the ALWTRP focuses on right, humpback, and fin whales, the measures also benefit minke whales. These species' status can be summarized as follows:

- **Right Whale:** The North Atlantic right whale (*Eubalaena glacialis*) is among the rarest of all large cetaceans and one of the most endangered species in the world. NMFS considers the best estimate of the number of North Atlantic right whales to be approximately 300 (+/- 10%). NMFS believes that the stock is well below the optimum sustainable population (OSP), especially given apparent declines in the population; as such, potential biological removal (PBR) has been set to zero.
- **Humpback Whale:** The North Atlantic humpback whale (*Megaptera novaeangliae*) is listed as an endangered species under the ESA. For the Gulf of Maine stock of humpback whales, NMFS estimates a minimum population size of 647 and has established a PBR level of 1.3 whales per year (Waring et al., 2003).

- **Fin Whale:** NMFS has listed the fin whale (*Balaenoptera physalus*) in U.S. waters of the North Atlantic as endangered. Researchers debate the possibility of several distinct subpopulations, with an estimated minimum population size of 2,362 and PBR of 4.7.
- **Minke Whale:** The minke whale (*Balaenoptera acutorostrata*) is not listed as endangered or threatened under the ESA. The best estimate of the population of Canadian east coast minke whales is 4,018, with a minimum population estimate of 3,515. The PBR for this stock of minke whales is 35.

Atlantic large whales are at risk of becoming entangled in fishing gear because the whales feed, travel and breed in many of the same ocean areas utilized for commercial fishing. Fishermen typically leave fishing gear such as gillnets and traps/pots in the water for a discrete period, after which time the nets/traps/pots are hauled and their catch retrieved. While the gear is in the water, whales may become entangled in the lines and nets that comprise trap/pot and gillnet fishing gear. The effects of entanglement can range from no permanent injury to death.

A scarification analysis conducted by the New England Aquarium (Knowlton et al., 2002), found that juvenile right whales are entangled with greater frequency than adults. Juvenile animals may not have sufficient strength to break free from entangling lines, which can lead to serious injury and infection resulting from the animal "growing into" the lines.

A study of right whale and humpback whale entanglements (Johnson et al., 2005) found that in cases where the point of gear attachment was known, right whale entanglements frequently (77.4 percent; 24 of 31 entanglement events) involved the mouth (some included other points of gear attachment on the body), which may indicate that many entanglements occur while whales are feeding. The study also found that humpback whales are more commonly reported with entanglements in the tail region (53.0 percent; 16 of 30 entanglement events), in cases where the point of attachment was known.<sup>6</sup> The number of entanglements for which gear type can be identified is too small to detect any trends in the type of gear involved in lethal entanglements. Trap/pot and gillnet gear, however, seem to be the most common, as 89 percent of the entanglements for which gear is recovered and identified involve trap/pot or gillnet gear (Johnson et al., 2005). The study confirms that vertical lines and floating groundlines pose risks for large whales; however, the authors conclude that any type and part of fixed gear is capable of entangling a whale, and several body parts of the whale can be involved.

Exhibit 10-1 summarizes all known serious injury entanglements of right, humpback, fin, and minke whales from 1997 through 2001 (serious injury designations have not yet been made for entanglements in 2002). Humpback whales account for the

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<sup>6</sup> In some cases, other parts of the body in addition to the tail may have been entangled.

most serious injury entanglements (10), followed by right whales (four), then minke whales (three) and fin whales (one).

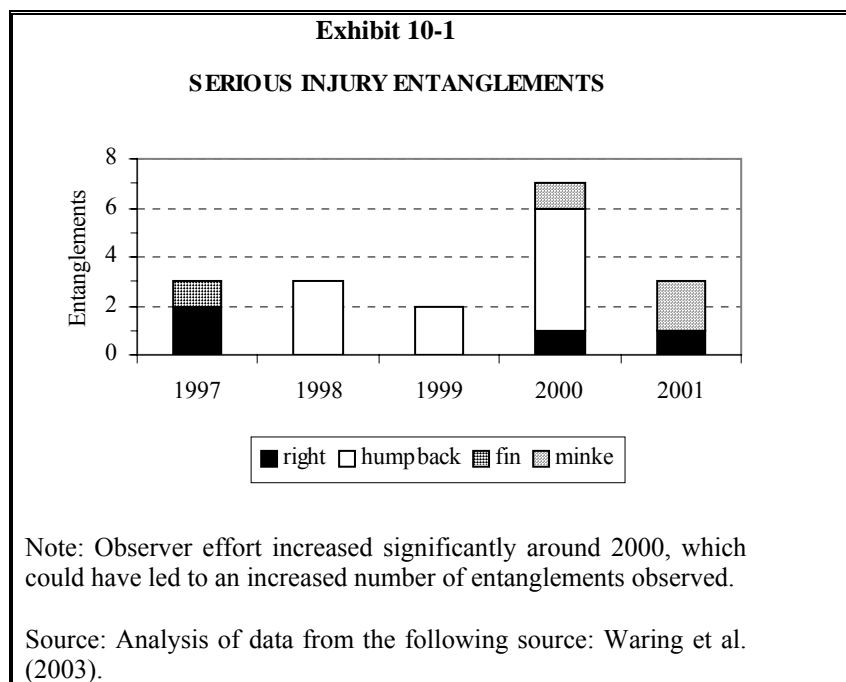
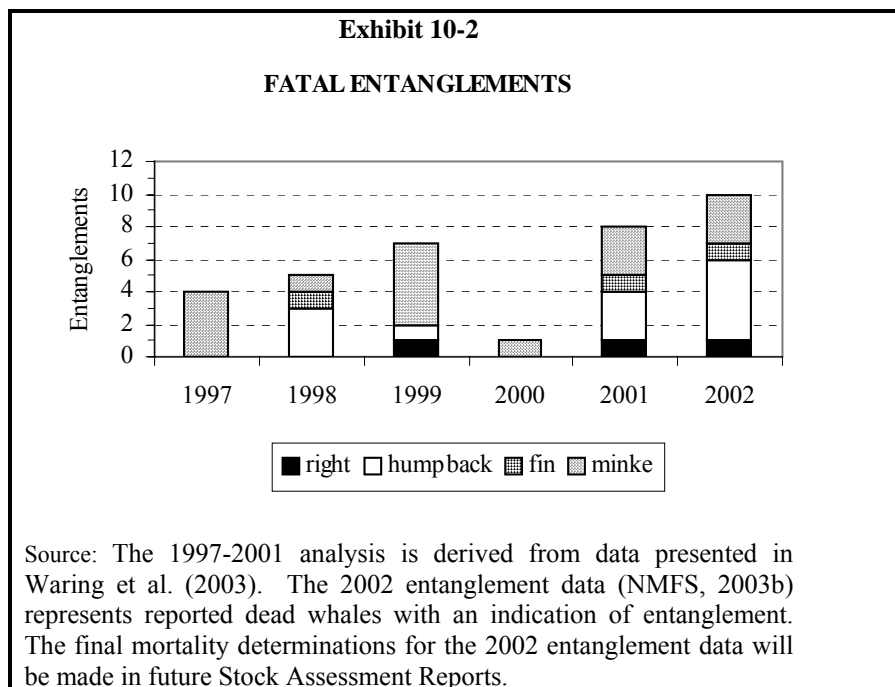


Exhibit 10-2 presents available data on fatal entanglements of Atlantic large whales from 1997 through 2002.<sup>7</sup> Minke whales account for the most known entanglement mortalities (17), followed by humpback whales (12), then right whales (three) and fin whales (three).

<sup>7</sup> Data for 1997 through 2001 include only those fatalities for which entanglement was the primary cause of death. The 2002 fatalities are associated with confirmed entanglements, although entanglement may not have been the primary cause of death.



#### 10.4 AFFECTED FISHERIES

As required by the Marine Mammal Protection Act (MMPA), NMFS maintains a List of Fisheries that places each commercial fishery into one of three categories. Fisheries are categorized according to the level of serious injury and mortality of marine mammals that occurs incidental to that fishery. The categorization of a fishery in the List of Fisheries determines whether participants in that fishery are subject to certain provisions of the MMPA such as registration, observer coverage, and take reduction plan requirements. Individuals fishing in Category I or II fisheries must comply with requirements of any applicable take reduction plan.<sup>8</sup>

Category I fisheries are associated with frequent incidental mortality and serious injury of marine mammals. These fisheries have a serious injury/mortality rate of 50 percent or more of a stock's potential biological removal rate (PBR). Category II fisheries are associated with occasional incidental mortality and serious injury of marine mammals, and have a serious injury/mortality rate of more than one percent but less than 50 percent of a stock's PBR. Category III fisheries rarely cause serious injury or mortality to marine mammals. Category III fisheries have a serious injury/mortality rate of one percent or less of a stock's PBR (NOAA, February 2002).

<sup>8</sup> Once a fishery is elevated to Category I or II status, it is eligible for inclusion under the ALWTRP; however, NMFS maintains discretion regarding which fisheries it feels must be folded into the Plan in order to provide adequate protection to right, humpback, and fin whales.

The List of Fisheries indicates which fisheries NMFS may regulate under the Atlantic Large Whale Take Reduction Plan (ALWTRP).<sup>9</sup> Specific fisheries were initially identified for inclusion under the ALWTRP based on documented whale interactions. In 1996, NMFS announced its intention to regulate the following Category I or II fisheries under the ALWTRP, based on the following documented whale interactions (61 FR 40819-40821):

- **Gulf of Maine, U.S. Mid-Atlantic lobster trap/pot fishery:** One record of a serious injury and/or mortality of a northern right whale, and 11 records of a serious injury and/or mortality of humpback whales were reported for this fishery from 1990 to 1994. In addition, NMFS received several reports of right whale entanglements prior to 1990 and after 1994 which are or may be attributable to the lobster fishery.
- **U.S. Mid-Atlantic coastal gillnet fishery:** Between 1989 and 1992, 31 humpback whales stranded from New Jersey through Virginia. Twenty-five percent of the stranded whales had scars consistent with net entanglement. Between 1990 and 1996, 10 humpbacks stranded in Virginia; three animals had rope abrasion injuries consistent with entanglement in gillnets.
- **New England multispecies sink-gillnet fishery:**<sup>10</sup> As of 1996, strategic marine mammal species/stocks seriously injured or killed in this fishery included several humpback whales and a northern right whale.
- **Southeastern U.S. Atlantic shark gillnet fishery:** A right whale calf was observed in February, 1994, approximately ten miles off Jacksonville, Florida, with severe cuts and other injuries. Researchers believe, based on the observed injuries, that the calf was entangled in gillnet gear, then hauled back into the fishing vessel's propeller as the gear was being retrieved. This method of gear retrieval is consistent with the shark gillnet fishery.

Overall, the fisheries currently regulated under the ALWTRP include the Northeast anchored float gillnet fishery; the Northeast/Mid-Atlantic American lobster trap/pot fishery; the Northeast sink gillnet fishery; the Southeast Atlantic gillnet fishery; Southeastern U.S. Atlantic shark gillnet fishery; and the U.S. Mid-Atlantic coastal gillnet fishery. As reviewed below, the ALWTRP modifications currently under consideration would include a variety of new fisheries, including additional trap/pot and gillnet fisheries.

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<sup>9</sup> Marine mammal take reduction plans relevant to Category I and II fisheries in the Atlantic Ocean include the Harbor Porpoise Take Reduction Plan (50 CFR 229.34), the Atlantic Large Whale Take Reduction Plan (50 CFR 229.32), and an upcoming Bottlenose Dolphin Take Reduction Plan.

<sup>10</sup> Currently the Northeast multispecies fishery.



## 10.5 REGULATORY ALTERNATIVES

### 10.5.1 Current ALWTRP Requirements

In response to its obligations under the MMPA, NMFS established the Atlantic Large Whale Take Reduction Team (ALWTRT) in 1996 to develop a plan for reducing the incidental take of large whales in commercial fisheries along the Atlantic Coast. The ALWTRT consists of representatives from the fishing industry, state and Federal resource management agencies, the scientific community, and conservation organizations. The ALWTRT provides guidance to NMFS in developing and amending the ALWTRP.

The ALWTRP seeks to reduce the risk of serious injury to or mortality of large whales due to accidental entanglement in U.S. commercial fishing gear. The Plan consists of restrictions on where and how gear can be set; research into whale populations, whale behavior, and fishing gear; outreach to inform fishermen of the entanglement problem and to seek their help in understanding and solving the problem; and a program to disentangle whales that do get caught in gear.

The ALWTRP includes a variety of gear modification requirements and restrictions, a Seasonal Area Management (SAM) program, and a Dynamic Area Management (DAM) program. The universal gear modification requirements apply to all lobster pots/traps and gillnets and include restrictions on floating line at the surface; restrictions on wet storage of gear; and voluntary restrictions on knots in buoy lines. Other gear restrictions are area- and season-specific, addressing times and locations where whale aggregations are greatest and therefore the risk of entanglement is especially high.

The SAM program was established by NMFS to protect predictable annual aggregations of North Atlantic right whales in the waters off Cape Cod and out to the boundary of the Exclusive Economic Zone (EEZ), as observed in aerial surveys from 1999 to 2001, from entanglement in lobster trap/pot and anchored gillnet gear. The SAM program incorporates two zones: SAM West, which is in effect from March 1 through April 30, and SAM East, which is in effect from May 1 through July 31. Trap/pot and gillnet gear set in the SAM zones during the designated times must be low risk gear. The ALWTRT defines low risk gear as gear that is *highly unlikely* to cause death or serious injury to entangled whales.

Under the DAM program, NMFS can temporarily restrict the use of lobster trap/pot and gillnet fishing gear within defined areas north of 40°00' N latitude to protect right whales. A DAM action is triggered by a single reliable report of an aggregation of three or more right whales within an area (75 square nautical miles) such that the whale density is equal to or greater than 0.04 right whales per square nautical mile. NMFS establishes a buffer zone around the whale aggregation and determines whether to impose temporary restrictions on fishing and/or fishing gear in the zone. Possible restrictions include mandatory removal of trap/pot and gillnet gear; modification of gear in order to

continue fishing in the DAM zone; and/or voluntary removal of gear and cessation of fishing.

### 10.5.2 Alternatives Considered

NMFS is considering various alternatives for modifying existing ALWTRP requirements, with the intent of identifying only one alternative in the FEIS. The alternatives under consideration seek to reduce the risk of large whale entanglement by including other trap/pot fisheries under the ALWTRP; reducing the profile of groundlines; and mandating gear modifications to vertical lines, for example, by requiring gear marking and the use of weak links of lower breaking strength. These changes are designed to address ongoing right, humpback, and fin whale entanglements that result in serious injury or mortality.

The essential aspects of the six alternatives can be summarized as follows:

- **Alternative 1 (No Action):** Under Alternative 1, NMFS would continue with the status quo, i.e., the baseline set of ALWTRP requirements currently in place.
- **Alternative 2:** Regulatory changes common to all fisheries would include weak links on all flotation or weighted devices attached to buoy lines; by 2008, all groundline associated with trap/pot or gillnet gear (excluding shark gillnets) would need to be sinking and/or neutrally buoyant line; and both seasonal area management (SAM) requirements and dynamic area management (DAM) requirements would be eliminated in 2008. Several new trap/pot fisheries would be brought under the Plan (including fisheries for black sea bass, scup, conch/whelk, shrimp, red crab, hagfish, and Jonah crab) and would have requirements similar to the current and proposed requirements for the lobster trap/pot fishery. In addition, Alternative 2 would extend ALWTRP requirements to the Northeast driftnet fishery, imposing regulations similar to those that apply to the Mid-Atlantic driftnet fishery. Alternative 2 would also extend ALWTRP requirements to the Northeast anchored float gillnet fishery, imposing requirements similar to those that apply to other components of the Northeast anchored gillnet fishery. Finally, a variety of new requirements would apply to specific fisheries and/or specific areas. All of these requirements are summarized in Exhibit 10-3. Alternative 2 would also introduce a revised set of gear marking requirements for all fisheries, establish exempted areas where ALWTRP requirements would not apply, and introduce a variety of regulatory language changes.
- **Alternative 3 (Preferred):** Alternative 3 would entail the same requirements as Alternative 2, but would impose these requirements on a

seasonal rather than year-round basis for fisheries in the Mid- and South Atlantic.

- **Alternative 4:** Alternative 4 would entail the same requirements as Alternative 2, but would impose these requirements on a seasonal rather than year-round basis for fisheries in the South Atlantic.
- **Alternative 5:** Alternative 5 would modify or expand the provisions of the existing seasonal area management (SAM) program. It would expand the SAM East and SAM West zones; require the upper two-thirds of buoy lines in SAM waters to be made of sinking and/or neutrally buoyant line; and allow two buoy lines for all trawls in SAM waters. It would also include the weak link requirements described under Alternative 2, applying them year-round in northern waters and seasonally in other waters. Finally, Alternative 5 would also bring the new fisheries addressed by Alternatives 2 through 4 under the ALWTRP; incorporate the same gear marking requirements, exempted areas, and regulatory language changes; and eliminate the DAM program. This alternative would not expand broad-based requirements coast-wide, such as the sinking and/or neutrally buoyant groundline requirements for trap/pot and anchored gillnet gear; the five or more weak links per net panel, depending on panel size, and anchoring requirements for gillnet gear in the Northeast; and the five or more weak links per net panel requirement for gillnet gear in the Mid-Atlantic. Also, the Northern Inshore Lobster Take Reduction Technology List would not be eliminated.
- **Alternative 6 (Preferred):** Alternative 6 would combine elements of Alternatives 3 and 5. Buoy line weak link requirements and broad-based gear requirements (net panel weak links, sinking and/or neutrally buoyant groundline, anchoring, gear marking, etc.) would be introduced on the same schedule and with the same seasonal and geographic provisions as described under Alternative 3; however, DAM requirements would be eliminated six months after publication of the rule (rather than in 2008), and the expanded SAM zone and SAM regulations described in Alternative 5 would apply from six months after publication until 2008, when the SAM zone would be eliminated and all groundline associated with trap/pot and anchored gillnet gear would be required to be sinking and/or neutrally buoyant line.

Exhibit 10-3 presents additional detail on the regulatory alternatives under consideration.

## **10.6 ECONOMIC ANALYSIS OF ALTERNATIVES**

### **10.6.1 Net Benefit Concepts**

NMFS guidance on economic analysis of fishery management actions recommends evaluation of net benefits within a benefit-cost framework.<sup>11</sup> Specifically, benefits and costs can be measured in terms of changes in producer and consumer surplus. Consumer surplus is the difference between what consumers of a good or service are willing to pay and the market price that they actually do pay. Producer surplus is the difference between producer revenues and operating costs, i.e., roughly speaking, it is profit earned by fishing vessels. The net change in consumer and producer surplus reflect the overall economic impact of the fishery management action.

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<sup>11</sup> National Marine Fisheries Service, 2000.

**Exhibit 10-3**  
**PROPOSED ALWTRP MANAGEMENT ALTERNATIVES 2 THROUGH 6**  
**(Requirements in Addition to Current ALWTRP Requirements)<sup>1</sup>**

<b>Fishery/Region</b>	<b>Component</b>	<b>Alternative 2</b>	<b>Alternative 3 (Preferred)</b>	<b>Alternative 4</b>	<b>Alternative 5</b>	<b>Alternative 6 (Preferred)</b>
Lobster – Northern Inshore and Nearshore Waters; Stellwagen Bank/Jeffrey’s Ledge Restricted Area; and Cape Cod Bay Restricted Area (5/16 – 12/31) <sup>2</sup>	Weak links	<ul style="list-style-type: none"> <li>Weak links on all flotation devices and/or weighted devices attached to the buoy line</li> <li>Eliminates existing take reduction technology list; 600-lb weak links on all flotation devices or devices attached to buoy line; applies only to Northern Inshore lobster waters and state portion of Cape Cod Bay Restricted Area (May 16 to December 31)</li> </ul>	= Alt. 2	= Alt. 2	Expanded SAM (see text)	= Alt. 3 but with expanded SAM until 2008 and early elimination of DAM
	Groundline	<ul style="list-style-type: none"> <li>Sinking and/or neutrally buoyant groundline year-round by 2008</li> </ul>				
	Other	<ul style="list-style-type: none"> <li>Trawls of four or fewer traps allowed only one buoy line; applies only to Northern Nearshore lobster waters, Stellwagen Bank/Jeffrey’s Ledge Restricted Area, and Federal portions of Cape Cod Bay Restricted Area (May 16 to December 31)</li> <li>SAM/DAM eliminated in 2008</li> </ul>				
Lobster – Offshore and Great South Channel Restricted Lobster Area (7/1 – 3/31) <sup>2</sup>	Weak links	<ul style="list-style-type: none"> <li>Weak links on all flotation devices and/or weighted devices attached to the buoy line</li> <li>Buoy line weak link strength of 1,500 lbs for fisheries in Offshore lobster waters and Great South Channel that overlaps LMA 2/3 Overlap and 3 (July 1 to March 31); 600-lb weak links for fisheries in other areas</li> </ul>	= Alt. 2 but requirements are seasonal for mid- and South Atlantic (see text)	= Alt. 2	Expanded SAM (see text)	= Alt. 3 but with expanded SAM until 2008 and early elimination of DAM
	Groundline	<ul style="list-style-type: none"> <li>Sinking and/or neutrally buoyant groundline year-round by 2008</li> </ul>				
	Other	<ul style="list-style-type: none"> <li>SAM/DAM eliminated in 2008</li> <li>Extend southern boundary by following the 100 fa line from 35°30’N to 27°51’N, and then extend out to EEZ</li> </ul>				
Lobster – Southern Nearshore <sup>2</sup>	Weak links	<ul style="list-style-type: none"> <li>Weak links on all flotation devices and/or weighted devices attached to the buoy line</li> </ul>	= Alt. 2 but requirements are seasonal for mid- and South Atlantic (see text)	= Alt. 2	Expanded SAM (see text)	= Alt. 3 but with expanded SAM until 2008 and early elimination of DAM
	Groundline	<ul style="list-style-type: none"> <li>Sinking and/or neutrally buoyant groundline year-round by 2008</li> </ul>				
	Other	<ul style="list-style-type: none"> <li>Apply all requirements to currently unregulated portion of Lobster Management Area 6 that is not included in exempted waters</li> <li>DAM eliminated in 2008</li> <li>Extend southern boundary by following the 100 fa line from 35°30’N to 27°51’N, and then extend inshore to coast or exempted areas; area south of 35°30’N would use the 100 fa line to define Southern Nearshore Lobster Waters</li> </ul>				
Black Sea Bass, Scup, Conch/Whelk, Shrimp, Hagfish, and Jonah Crab (trap/pot fisheries) <sup>3</sup>	Weak links	<ul style="list-style-type: none"> <li>Weak links on all flotation devices and/or weighted devices attached to the buoy line</li> <li>Buoy line weak link strength of 1,500 lbs for fisheries in Offshore lobster waters and Great South Channel that overlaps LMA 2/3 Overlap and 3 (July 1 to March 31); 600-lb weak links for fisheries in other areas</li> </ul>	= Alt. 2 but requirements are seasonal for mid- and South Atlantic (see text)	= Alt. 2 but requirements are seasonal for South Atlantic (see text)	Expanded SAM (see text)	= Alt. 3 but with expanded SAM until 2008 and early elimination of DAM
	Groundline	<ul style="list-style-type: none"> <li>Sinking and/or neutrally buoyant groundline year-round by 2008; effective six months after publication in Cape Cod Bay between January 1 and May 15 and in SAM waters</li> </ul>				
	Other	<ul style="list-style-type: none"> <li>Fold in under existing ALWTRP regulations (e.g., trawls of four or fewer traps allowed only one buoy line in Northern Nearshore lobster waters, Stellwagen Bank/Jeffrey’s Ledge Restricted Area and Federal portions of Cape Cod Bay Restricted Area during May 16 to December 31)</li> <li>Define southern boundary using definitions discussed under Southern Nearshore Lobster Waters and Offshore Lobster Waters</li> <li>Apply all requirements to currently unregulated portion of Lobster Management Area 6 that is not included in exempted waters</li> <li>SAM/DAM eliminated in 2008</li> </ul>				
Red Crab (trap/pot) <sup>3</sup>	Weak links	<ul style="list-style-type: none"> <li>Weak links on all flotation devices and/or weighted devices attached to the buoy line</li> <li>Buoy line weak link breaking strength of 2,000 lbs for operations in offshore lobster waters</li> </ul>	= Alt. 2 but requirements are seasonal for mid- and South Atlantic (see text)	= Alt. 2 but requirements are seasonal for South Atlantic (see text)	Expanded SAM (see text)	= Alt. 3 but with expanded SAM until 2008 and early elimination of DAM
	Groundline	<ul style="list-style-type: none"> <li>Sinking and/or neutrally buoyant groundline year-round by 2008</li> </ul>				
	Other	<ul style="list-style-type: none"> <li>Fold in under existing ALWTRP regulations</li> <li>Define southern boundary using definitions discussed under Southern Nearshore Lobster Waters and Offshore Lobster Waters</li> <li>Apply all requirements to currently unregulated portion of Lobster Management Area 6 that is not included in exempted waters</li> <li>SAM/DAM eliminated in 2008</li> </ul>				

**Exhibit 10-3**  
**PROPOSED ALWTRP MANAGEMENT ALTERNATIVES 2 THROUGH 6**  
**(Requirements in Addition to Current ALWTRP Requirements) <sup>1</sup>**

<b>Fishery/Region</b>	<b>Component</b>	<b>Alternative 2</b>	<b>Alternative 3 (Preferred)</b>	<b>Alternative 4</b>	<b>Alternative 5</b>	<b>Alternative 6 (Preferred)</b>
Gillnet – Northeast, Anchored <sup>4</sup>	Weak links	<ul style="list-style-type: none"> <li>Weak links on all flotation devices and/or weighted devices attached to the buoy line</li> <li>Increase number of 1,100-lb weak links per panel from one to five or more, depending on net size,* year-round</li> </ul>	= Alt. 2 (but requirements are seasonal south of 40°N)	= Alt. 2	Expanded SAM (see text)	= Alt. 3 but with expanded SAM until 2008
	Groundline	<ul style="list-style-type: none"> <li>Sinking and/or neutrally buoyant groundline year-round by 2008</li> </ul>				
	Other	<ul style="list-style-type: none"> <li>SAM/DAM eliminated in 2008</li> <li>All anchored gillnets must be anchored with the holding power of at least 22-lb Danforth-style anchor at each end of net string</li> <li>Fold in Northeast anchored float gillnet fishery under existing ALWTRP regulations</li> </ul>				
Gillnet – Northeast, Driftnet <sup>5</sup>	Weak links	<ul style="list-style-type: none"> <li>One 1,100-lb weak link per panel when fishing tended gear at night</li> </ul>	= Alt. 2 (but requirements are seasonal south of 40°N)	= Alt. 2	Expanded SAM (see text)	= Alt. 3 but with expanded SAM until 2008
	General	<ul style="list-style-type: none"> <li>Fold in and regulate same as Mid-Atlantic driftnet</li> <li>Seasonal closures in Cape Cod Bay (Jan. 1 to May 15) and Great South Channel (April 1-June 30)</li> </ul>				
Gillnet – Mid-Atlantic, Anchored <sup>6</sup>	Weak links	<ul style="list-style-type: none"> <li>Weak links on all flotation devices and/or weighted devices attached to the buoy line</li> <li>All nets must return to port with the vessel <i>or</i> contain five or more (rather than one) 1,100-lb. weak links per net panel, depending on size* (and be anchored at each end of net string with an anchor having the holding power of a 22-lb Danforth-style anchor, as previously required)</li> </ul>	= Alt. 2 but requirements are seasonal (see text)	= Alt. 2	Expanded SAM (see text)	= Alt. 3 but with expanded SAM until 2008 and early elimination of DAM
	Groundline	<ul style="list-style-type: none"> <li>Sinking and/or neutrally buoyant groundline year-round by 2008</li> </ul>				
	Other	<ul style="list-style-type: none"> <li>Time period for all requirements expanded to year-round (vs current period of Dec. 1 to March 31)</li> <li>Include gillnets that are weighted to bottom but do not have an anchor on either end and gillnets that are anchored at each end but not weighted to the bottom</li> <li>DAM eliminated in 2008</li> <li>Waters between 72°30'W and EEZ that are south of VA/NC border and north of SC/GA border folded into Mid-Atlantic anchored gillnet regulations</li> </ul>				
Gillnet – Mid-Atlantic, Driftnet <sup>6</sup>	Weak links	<ul style="list-style-type: none"> <li>One 1,100-lb weak link per panel when fishing tended gear at night</li> </ul>	= Alt. 2 but requirements are seasonal (see text)	= Alt. 2	Expanded SAM (see text)	= Alt. 3
	General	<ul style="list-style-type: none"> <li>Time period for all requirements expanded to year-round (vs current period of Dec. 1 to March 31)</li> <li>Waters between 72°30'W and EEZ that are south of VA/NC border and north of SC/GA border folded into Mid-Atlantic drift gillnet regulations</li> </ul>				
Shark Gillnet – Southeast <sup>7</sup>	General	<ul style="list-style-type: none"> <li>Extend 80°00' W longitude boundary and associated requirements to EEZ</li> <li>Replace current time period (November 15 to March 31) as follows: <ul style="list-style-type: none"> <li>From SC/GA border to 29°00'N: Restrictions apply from November 15 to April 15</li> <li>From 29°N to 26°46.5'N: Restrictions apply from December 1 to March 31 (keep 27°51'N as southern line of "Restricted Area" during this time period)</li> </ul> </li> <li>Strikenet gear in Southeast U.S. Restricted Area must be removed immediately if right, humpback, or fin whale moves within 3 nautical miles (year-round)</li> <li>Require use of vessel monitoring system in lieu of 100% observer coverage</li> </ul>	= Alt. 2 but requirements are seasonal (see text)	= Alt. 2 but requirements are seasonal (see text)	Expanded SAM (see text)	= Alt. 3

**Exhibit 10-3**  
**PROPOSED ALWTRP MANAGEMENT ALTERNATIVES 2 THROUGH 6**  
**(Requirements in Addition to Current ALWTRP Requirements)<sup>1</sup>**

<b>Fishery/Region</b>	<b>Component</b>	<b>Alternative 2</b>	<b>Alternative 3 (Preferred)</b>	<b>Alternative 4</b>	<b>Alternative 5</b>	<b>Alternative 6 (Preferred)</b>
Coastal Gillnet – Southeast <sup>8</sup>	General	<ul style="list-style-type: none"> <li>Extend 80°00' W longitude boundary and associated requirements to EEZ</li> <li>Implement gillnet restrictions (similar to Mid-Atlantic anchored gillnet fisheries) between SC/GA border and the NC/SC border</li> <li>Replace current area/time management measures as follows: <ul style="list-style-type: none"> <li>From SC/GA border to 29°00'N: Restrictions apply from November 15 to April 15</li> <li>From 29°00'N to 27°51'N: Restrictions apply from December 1 to March 31</li> </ul> </li> <li>Require gear modification similar to Mid-Atlantic gillnets that are weighted to bottom but do not have anchor at either end (e.g., weak links in net panels and on buoys; year-round)</li> </ul>	= Alt. 2 but requirements are seasonal (see text)	= Alt. 2 but requirements are seasonal (see text)	Meet existing requirements for Mid-Atlantic gillnets	= Alt. 3
	Weak links	<ul style="list-style-type: none"> <li>Weak links on all flotation devices and/or weighted devices attached to the buoy line</li> <li>All nets must return to port with the vessel <i>or</i> contain five or more (rather than one) 1,100-lb. weak links per net panel, depending on size* (and be anchored at each end of net string with an anchor having the holding power of a 22-lb Danforth-style anchor, as previously required)</li> </ul>				
	Groundline	<ul style="list-style-type: none"> <li>Sinking and/or neutrally buoyant groundline year-round by 2008</li> </ul>				
All Fisheries	Exempted Areas	<ul style="list-style-type: none"> <li>Areas landward of 72 COLREGS line, with exceptions for Boston Harbor, Gardiners Bay (NY), and portions of the Maine coast</li> <li>No requirement for sinking and/or neutrally buoyant groundline in waters greater than 280 fathoms</li> </ul>	→	→	→	→
	Gear Marking	<ul style="list-style-type: none"> <li>Remove current ALWTRP gear marking scheme (except net panel marking for shark gillnet gear)</li> <li>Mark surface buoys with vessel or permit number</li> <li>Mark buoy lines with one 4-inch mark every 10 fathoms or one 4-inch mark in the center of buoy lines 10 fathoms or less (shark vessels with buoy lines &lt; 4 feet are exempt)</li> </ul>	→	→	→	→

## Notes:

- <sup>1</sup> See Section 1.2.1 for a description of the current ALWTRP requirements. Note that Alternative One is the No Action Alternative.
- <sup>2</sup> Northeast/Mid-Atlantic American lobster trap/pot fishery in the 2003 List of Fisheries.
- <sup>3</sup> Atlantic mixed species trap/pot fishery in the 2003 List of Fisheries. The trap/pot fisheries affected by this action could include other species (e.g., blue crab), although these species are caught primarily in exempt waters.
- <sup>4</sup> Northeast sink gillnet fishery in the 2003 List of Fisheries
- <sup>5</sup> Northeast drift gillnet fishery in the 2003 List of Fisheries
- <sup>6</sup> Mid-Atlantic coastal gillnet fishery in the 2003 List of Fisheries
- <sup>7</sup> Southeastern U.S. Atlantic shark gillnet fishery in the 2003 List of Fisheries
- <sup>8</sup> Southeast Atlantic gillnet fishery in the 2003 List of Fisheries

→ Requirement applies across all Alternatives

\* The regulatory text will clarify that the placement of net panel weak links will be as follows: For all variation in panel size the following weak link requirements would apply: 1) weak links must be placed in the center of each of the up and down lines at both ends of each net panel; and 2) one floatline weak link must be placed as close as possible to each end of the net panel just before the floatline meets the up and down line. Also, for net panels of 50 fathoms or less in length, one floatline weak link must be placed at the center of the net panel, and for net panels greater than 50 fathoms, weak links must be placed continuously along the floatline separated by a maximum distance of 25 fathoms.

The proposed modifications to the ALWTRP requirements may affect consumer surplus in several ways. First, to the extent that significant changes in landings of commercial species are realized, seafood prices may be affected. In particular, reduced landings may increase prices, leading to reductions in consumer surplus enjoyed by seafood consumers. Analyzing such changes requires data on demand elasticity for the seafood products in question. Because these data are not readily available for many species, thorough analysis of consumer surplus for seafood consumption can be complex and resource intensive. However, the proposed ALWTRP regulations are not likely to cause major shifts in landed quantities; therefore, anticipated consumer surplus loss for seafood consumers is not likely to be a significant component of the overall net benefit change.

In addition, consumer surplus benefits may be realized through protection of endangered large whale species. Likewise, the ALWTRP requirements will introduce new costs for vessels in affected fisheries, reducing overall producer surplus. Both of these net benefit components are discussed in greater detail below.

### **10.6.2 Economic Benefits of Large Whale Protection**

Since the suspension of commercial whaling in the U.S., there has been no conventional market for the consumptive use of products derived from whales. Nonetheless, whale protection and associated increases in whale populations may yield two major types of economic benefits: (1) non-consumptive use benefits; and (2) non-use benefits.

#### **10.6.2.1 Non-Consumptive Use Benefits**

Individuals who view and photograph whales from private recreational vessels or from commercial whale watch vessels will enjoy enhanced consumer surplus to the extent that the ALWTRP successfully protects and enhances whale populations. A number of studies have demonstrated that individuals on commercial whale watch vessels realize significant levels of consumer surplus. For instance, Hoagland and Meeks (2000) studied the demand for whalewatching at the Stellwagen Bank National Marine Sanctuary and found that whale watchers realized an average consumer surplus of about \$26 per whale watching trip. Other studies have noted that enjoyment of non-consumptive viewing is positively correlated with the number of whales sighted. For instance, a study at the Stellwagen Bank National Marine Sanctuary asked respondents to cite the most attractive features of a whalewatch; the top responses included the number of whales seen as well as the number of species seen. Likewise, Loomis and Larson (1994) determined that whale watch riders viewing gray whales were willing to pay more for the experience when populations were increased.

While it is not feasible to quantify the increase in whale sighting or the associated consumer surplus changes associated with the ALWTRP, it is possible to characterize the overall size and popularity of commercial whale watching operations on the east coast. While complete data on the industry are lacking, a study by Hoyt (2000) attempted to compile data for operations worldwide. Roughly half of all commercial whale watching worldwide occurs in the U.S., and



much of this activity is centered in New England.<sup>12</sup> As shown in Exhibit 10-4, the Hoyt study identified 36 whale watching businesses in New England, with most operating multiple vessels. Hoyt estimated that over one million individuals take whale watching tours in the region, yielding over \$30 million in revenue each year. Because these figures only apply to permitted and registered operations, the full scale and economic impact of whale watching activity is likely greater. Overall, given the level of activity in the industry, consumer surplus benefits associated with enhanced whale watching could be significant.

<b>Exhibit 10-4</b>				
<b>NEW ENGLAND WHALE WATCHING INDUSTRY</b>				
<b>State</b>	<b>Number of Operations</b>	<b>Number of Vessels</b>	<b>Annual Ridership</b>	<b>Annual Revenue (millions \$)</b>
Massachusetts	17	30-35	1,000,000	\$24.0
New Hampshire	4	6-10	80,000	\$1.9
Maine	14	18-24	137,500	\$4.4
Rhode Island	1	1	12,500	\$0.3
<b>TOTAL</b>	<b>36</b>	<b>55-70</b>	<b>1,230,000</b>	<b>\$30.6</b>
Source: Hoyt, 2000.				

Finally, it is noteworthy that increased whale populations may yield benefits in the form of producer surplus, in addition to consumer surplus improvements. Operators of whale watch vessels realize producer surplus to the extent that revenues exceed operating costs. Larger whale populations may increase demand for whale watch services, increasing ridership and/or the price that customers are willing to pay. In either case, whale watch operations may become more profitable.

#### **10.6.2.2 Non-Use Benefits**

A second economic benefit category associated with whale protection is non-use benefits. While no conventional market exists within which products derived from large whales are traded in the U.S., these animals nonetheless have economic value.<sup>13</sup> Economic research has demonstrated that society places economic value on (relatively) unique environmental assets, whether or not those assets are ever directly exploited. For example, society places real (and potentially measurable) economic value on simply knowing that large whale populations are flourishing in their natural environment (often referred to as “existence value”). Society also places economic value on the immediate (or optional future) opportunity to directly use (either in a consumptive, or non-consumptive way) large whales.

<sup>12</sup> Although whale watching operations exist in the mid- and South Atlantic states, the degree of activity is smaller and cannot be reliably distinguished from tours to view other species such as dolphins.

<sup>13</sup> Portions of this discussion of non-use benefits are based on NMFS, *Steller Sea Lion Protection Measures, Final Supplemental Environmental Impact Statement*, November 2001.

The absence of a conventional economic market for a good makes it difficult for economists to place monetary values on large whales. One way to estimate non-market (e.g., existence) values is by surveying people to determine what they are willing to pay for a resource or programs to protect that resource. This approach is termed the “contingent value” method or, alternatively, CV or CVM, and a substantial literature has developed which describes the application of this technique to the valuation of natural resource assets.<sup>14</sup>

Economists have developed several studies of the non-use value associated with protection of whales or other marine mammals. Exhibit 10-5 summarizes these studies. In each, researchers surveyed individuals on their willingness to pay (WTP) for programs that would maintain or increase marine mammal populations. While none of these studies focuses specifically on north Atlantic right, humpback, fin, or minke whales, they do demonstrate that individuals derive economic value from the protection of marine mammals.

<b>Exhibit 10-5</b>		
<b>STUDIES OF NON-USE VALUE ASSOCIATED WITH MARINE MAMMALS</b>		
<b>Author</b>	<b>Title</b>	<b>Findings</b>
Giraud et al. (2002)	Economic Benefit of the Protection of the Stellar Sea Lion	Estimated WTP for an expanded Stellar sea lion protection program. The average WTP for the entire nation amounted to roughly \$61 per person.
Hageman (1985)	Valuing Marine Mammal Populations: Benefit Valuations in a Multi-Species Ecosystem	Per-household WTP for Gray and Blue Whales, Bottlenose Dolphins, California Sea Otters, and Northern Elephant Seals estimated to be \$23.95, \$17.73, \$20.75, and \$18.29 per year, respectively (1984 dollars).
Loomis and Larson (1994)	Total Economic Values of Increasing Gray Whale Populations: Results From a Contingent Valuation Survey of Visitors and Households	Mean WTP of U.S. households for an increase in gray whale populations estimated to be \$16.18 for a 50 percent increase and \$18.14 for a 100 percent increase.
Day (1985), cited in Rumage (1990)	The Economic Value of Whalewatching at Stellwagen Bank. The Resources and Uses of Stellwagen Bank	Non-use value of the presence of whales in the Massachusetts Bays system estimated to be \$24 million.
Samples et al. (1986)	Information Disclosure and Endangered Species Valuation	Estimated individual WTP for protection of humpback whales of \$39.62 per year.
Samples and Hoyller (1990)	Contingent Valuation of Wildlife Resources in the Presence of Substitutes and Complements	Respondents' average WTP (lump sum payment) to protect humpback whales in Hawaii ranged from \$125 to \$142 (1986 dollars).

### 10.6.2.3 Relative Ranking of Alternatives

The relative degree to which the regulatory alternatives deliver use and non-use benefits is directly related to the biological impacts associated with each alternative, i.e., public benefits are correlated with whale conservation. As reviewed in the biological impacts analysis (see Chapter 5), the spatial and temporal differences in the gear modification requirements suggest that Alternative 2 would provide the highest level of protection, followed by Alternative 4, then Alternatives 3 (Preferred) and 6 (Preferred); Alternative 5 would afford a significantly lower

<sup>14</sup> See, for example, Mitchell and Carson, 1989.

degree of protection. The actual risk-reduction potential of Alternatives 2, 3 (Preferred), 4, and 6 (Preferred), however, is unlikely to vary greatly. The seasonal exemptions provided under Alternatives 3 (Preferred), 4, and 6 (Preferred) are premised on the migratory patterns of whales. Current understanding of these patterns suggests that the potential for entanglement of a whale in Mid-Atlantic or South Atlantic waters during summer months is small. As a result, year-round requirements likely offer little incremental risk reduction relative to seasonal standards.

### **10.6.3 Fishing Industry Compliance Costs**

The economic impact analysis developed for this EIS provides detailed estimates of the compliance costs associated with potential changes to the ALWTRP. The analysis examines average compliance costs for model vessels and estimates the overall cost to the commercial fishing industry of complying with the regulatory changes under consideration. The analysis measures the cost of complying with these new requirements relative to the status quo – i.e., a baseline scenario that assumes no change in existing ALWTRP requirements. Thus, all estimates of compliance costs are incremental to those already incurred in complying with the ALWTRP.

This section summarizes the costs of complying with the requirements under each of the ALWTRP regulatory alternatives, reviewing both average and industry-wide compliance costs. Additional detail on the methods and results of the economic impact analysis can be found in Chapter 6.

#### **10.6.3.1 Average Vessel Compliance Costs**

The economic impact analysis first calculates the compliance costs for model vessels, defined by species sought and fishing location. Average vessel compliance costs include both the expenses associated with reconfiguring gear as required under the new ALWTRP regulations and the costs (or savings, for some vessel groups) associated with replacing gear more (or less) frequently due to gear loss.

The cost associated with converting trap/pot and gillnet gear to comply with the ALWTRP modifications includes the labor and material costs associated with weak links, groundline, gear marking, buoy line, and anchoring modifications.<sup>15</sup> Average annual costs are derived based on costs that would be incurred in year one of the regulation (2005)<sup>16</sup>, the second and third phase-in years, 2008, and on an ongoing basis thereafter. A seven percent discount rate is used to annualize all costs. Appendix C in Chapter 6 provides a detailed discussion of the individual parameters used in estimating gear conversion costs.

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<sup>15</sup> In this DEIS, based on the best available information, it was assumed that anchored gillnet vessels in the Northeast and Mid-Atlantic fish net panels that average 50 fathoms (300 feet) in length. Thus, for these areas, gillnet vessels were analyzed as utilizing five weak links per net panel.

<sup>16</sup> Please note that the date of January 1, 2005 was selected for the purpose of analyzing the impacts of the proposed alternatives in this DEIS. However, the implementation of regulations associated with this date in the DEIS would become effective six months after publication of a final rule.

In addition, certain ALWTRP gear modifications could affect gear loss. The analysis assumes that vessels converting from floating groundline and buoy line to sinking and/or neutrally buoyant line, as well as vessels using only one buoy line, would lose approximately five to ten percent more gear each year (see Chapter 6 for discussion). In contrast, vessels currently subject to SAM area regulations would lose up to five percent less gear each year due to relaxed restrictions such as using a second buoy line and converting one-third of non-floating or neutrally buoyant buoy line to floating line.

### **10.6.3.2 Total Industry Compliance Costs**

Once compliance costs for the model vessels are calculated, the analysis estimates the number of vessels represented by each model vessel (i.e., the number of vessels within a particular category). The analysis uses data on Federal and state-permitted vessels to estimate the number of vessels in each category, identifying vessels that have actively fished with the applicable gear types and might therefore be affected by changes to the ALWTRP. After identifying and removing vessels that operate within exempt waters, each of the remaining vessels is assigned to the appropriate model vessel category.

The product of the annual compliance costs for each model vessel and the number of affected vessels in each category provides an estimate of annual compliance costs for the category as a whole. The sum of compliance costs across all vessel categories provides an estimate of compliance costs for the commercial fishing industry.

### **10.6.3.3 Economic Impact Results**

Exhibit 10-6 summarizes estimated industry compliance costs for each of the regulatory alternatives, breaking the results down by fishing sector (lobster, other trap/pot, and gillnet). As shown, the incremental costs imposed on the fishing industry would equal approximately \$14.2 million per year under Alternatives 2, 3 (Preferred), 4, and 6 (Preferred). The impact of the new standards on lobster vessels would account for over 90 percent of these costs.

Aside from Alternative 1 (No Action), the only regulatory alternative that differs significantly from the others with respect to estimated economic impacts is Alternative 5. The analysis suggests that this alternative would impose incremental regulatory costs of approximately \$1.0 million annually. The costs are lower because Alternative 5 would not impose as broad a set of gear modification requirements, but would instead modify the SAM zone and focus primarily upon the regulation of vessels fishing in that zone.

## **10.7 SOCIAL IMPACTS OF ALTERNATIVES**

The analysis of social impacts considers how compliance with the regulatory alternatives could affect the socioeconomic viability of fishing and fishermen's quality of life. The method and results described here are presented in greater detail in Chapter 7.

## Exhibit 10-6

## ESTIMATED INCREASE IN ANNUAL ALWTRP COMPLIANCE COSTS

<b>Economic Impact</b>	<b>Regulatory Alternative</b>	<b>Lobster Trap/Pot Vessels</b>	<b>Other Trap/Pot Vessels</b>	<b>Gillnet Vessels</b>	<b>Total</b>
Average Increase in Annual Compliance Costs For Vessels Affected by Changes in ALWTRP Regulations	Alternative 1 (No Action)	\$0	\$0	\$0	N.A.
	Alternative 2	\$3,484	\$1,055	\$917	N.A.
	Alternative 3 (Preferred)	\$3,483	\$1,060	\$925	N.A.
	Alternative 4	\$3,484	\$1,055	\$923	N.A.
	Alternative 5	\$210	\$184	\$163	N.A.
	Alternative 6 (Preferred)	\$3,482	\$947	\$925	N.A.
Number of Vessels Affected by Changes in ALWTRP Regulations	Alternative 1 (No Action)	0	0	0	0
	Alternative 2	3,686	418	1,044	5,148
	Alternative 3 (Preferred)	3,684	413	1,024	5,121
	Alternative 4	3,686	418	1,035	5,139
	Alternative 5	3,684	416	1,024	5,124
	Alternative 6 (Preferred)	3,684	416	1,024	5,124
Total Increase in Annual Compliance Costs for Vessels Affected by Changes in ALWTRP Regulations	Alternative 1 (No Action)	\$0	\$0	\$0	\$0
	Alternative 2	\$12,844,000	\$440,900	\$957,300	\$14,242,200
	Alternative 3 (Preferred)	\$12,830,500	\$438,100	\$946,700	\$14,215,300
	Alternative 4	\$12,844,000	\$440,900	\$955,600	\$14,240,500
	Alternative 5	\$773,800	\$76,500	\$168,000	\$1,018,400
	Alternative 6 (Preferred)	\$12,826,700	\$394,000	\$947,300	\$14,168,100
Note: Totals may not sum due to rounding.					

### 10.7.1 Potentially Affected Communities

The social impact analysis first uses county-level data on affected fishing vessels to identify the communities at greatest risk of experiencing adverse social impacts stemming from the ALWTRP modifications under consideration. The analysis uses additional county-level socioeconomic data to characterize key features of the at-risk communities, examining economic, demographic, and social features that may influence the impact of the regulations on the region.

The analysis defines at-risk counties as those with over 100 active vessels that must comply with ALWTRP requirements and which report annual landings of greater than two million pounds by vessels using gear potentially subject to regulation under the ALWTRP. Based on these criteria, Exhibit 10-7 lists the at-risk counties. The list is heavily weighted toward the Northeast, particularly several coastal counties in Maine where lobstering is prevalent. Although the dealer and processing sectors are small to medium in size in these areas, they are frequently part of small communities and play an important role in regional economies in the state. Several of the Maine counties are rural and have limited economic diversification and/or higher than average unemployment and poverty rates. Other at-risk communities include urbanized ports (e.g., Gloucester, Portland, New Bedford) where fishing activities are linked to major processing operations.

<b>Exhibit 10-7</b>		
<b>KEY COMMUNITIES AFFECTED BY ALWTRP MODIFICATIONS</b>		
<b>At-Risk County<sup>1</sup></b>	<b>State</b>	<b>Major Ports<sup>2</sup></b>
Cumberland	ME	Portland, Harpswell
Hancock	ME	Stonington/Deer Isle
Knox	ME	Rockland, Vinalhaven
Lincoln	ME	South Bristol, Boothbay Harbor
Washington	ME	Beals Island and Jonesport, Cutler, Eastport, Lubec
York	ME	Kennebunkport/Cape Porpoise
Rockingham	NH	Hampton/Seabrook, Portsmouth, Isles of Shoals
Essex	MA	Gloucester, Rockport, Marblehead
Plymouth	MA	Plymouth, Scituate
Barnstable	MA	Sandwich, Hyannis, Chatham, Provincetown
Bristol	MA	New Bedford, Fairhaven, Westport
Washington	RI	Point Judith/Galilee
Newport	RI	Jamestown, Newport, Tiverton, Sakonnet Point
Suffolk	NY	Hampton Bays, Montauk, Greenport
Ocean	NJ	Point Pleasant, Long Beach/Barnegat Light
Notes:		
<sup>1</sup> For this analysis, at-risk counties are defined as those with over 100 active vessels that must comply with ALWTRP requirements and which report annual landings of greater than two million pounds by vessels using gear potentially subject to regulation under the ALWTRP. This list is heavily weighted toward the Northeast, particularly several coastal counties in Maine where lobstering is prevalent.		
<sup>2</sup> Major ports based on Hall-Arber et al. (2001) and McCay and Cieri (2000).		

## **10.7.2 Comparison of Vessel Compliance Costs to Ex-Vessel Revenues**

To further examine the potential for socioeconomic impacts from the revised ALWTRP requirements, this analysis considers the economic burden placed on different classes of vessels. Placing vessel compliance costs in the context of typical ex-vessel revenues helps determine whether the costs will be significant enough to cause behavioral changes (e.g., vessel retirement) on the part of vessel operators. The analysis defines “heavily affected” vessels as those for which annual compliance costs exceed 15 percent of average annual revenues. The analysis further defines “at risk” vessels as those for which annual compliance costs are between 5 and 15 percent of annual revenue.

Although the potential for adverse social impacts is significant, a comparison of annual vessel compliance costs to vessel revenue suggests that a limited subset of fishing vessels are likely to face costs significant enough to drive them out of business. Although uncertainties exist in the analysis, the most heavily affected vessels appear to be few in number (relative to the full set of potentially affected vessels) and small in size. Therefore, they employ a relatively small number of fishermen (about two percent of those on all potentially affected vessels) and account for a relatively small share of landings. In reality many fishermen would likely adjust to the modified ALWTRP regulations (e.g., fish in exempted waters) rather than leave fishing. These adjustments, combined with the fact that small decreases in landings would likely be made up by other vessels, suggests that impacts on dealers and processors would be minor.

Numerous other vessels (approximately 2,600) fall in the at-risk vessel category. The at-risk vessels are dominated by Class II lobster vessels; of these, the most affected subsets are vessels in Maine, which are estimated to have greater gear loss costs. It is difficult to gauge how these vessel operators may respond to the ALWTRP modifications under consideration. However, to the extent that these vessels are driven out of business, social and economic impacts could be significant.

Most of the regulatory alternatives under consideration vary little with respect to their potential social and socioeconomic impacts. The number of vessels considered heavily affected is essentially identical under Alternatives 2, 3 (Preferred), 4, and 6 (Preferred). The socioeconomic implications of these alternatives vary little because most of the vessels the analysis identifies as heavily affected are based in the Northeast, where the provisions of Alternatives 2, 3 (Preferred), 4, and 6 (Preferred) do not vary. Analysis of Alternative 5 (the modified SAM) shows very few vessels would face compliance costs that qualify them as heavily affected.

## **10.7.3 Other Socioeconomic Impacts**

### **10.7.3.1 Negative Impacts**

Fishermen may realize a variety of other negative social impacts in complying with ALWTRP modifications:

- To avoid the requirements associated with the new ALWTRP regulations, fishermen may choose to fish increasingly in exempted waters. This relocation could consequently cause vessel congestion, gear conflicts, and competition for fishing grounds in exempted bays and harbors to increase.
- Furthermore, revised ALWTRP gear modifications may result in an increased incidence of gear loss. In addition to the costs incurred to replace lost gear, fishermen may also spend more time and resources hauling, grappling for, and repairing gear. This could potentially increase the hours that fishermen spend at sea.
- Likewise, certain aspects of the ALWTRP modifications may have safety implications for fishermen. For example, sinking and/or neutrally buoyant groundline is more likely to snag on marine debris, and hauling snagged gear could be dangerous.
- Finally, the compliance cost burden may create a competitive disadvantage for smaller lobster vessels, causing industry consolidation.

#### **10.7.3.2 Positive Impacts**

Changes to the ALWTRP may also have a variety of positive social impacts. First, fishermen may experience safety benefits:

- Alternatives 2 through 6 include the elimination of the DAM program. Under Alternatives 2 through 4, the program would cease in 2008; under Alternatives 5 and 6, it would end within six months of promulgation of the new rule. Industry representatives have asserted that DAM provisions can be burdensome, requiring unanticipated gear removals that disrupt fishermen's schedules and that may cause safety issues in times of bad weather.
- Alternatives 2 through 6 call for elimination of current rules that limit trawls of five or fewer traps to one buoy line, lowering the cutoff to four or fewer traps. The addition of a buoy line may help avoid gear conflicts and reduce gear loss, grappling, and associated safety issues.

In addition, the use and non-use welfare benefits enjoyed by the general public (see above) would represent another component of the social impacts of the ALWTRP modifications.

Exhibit 10-8 summarizes the social impacts of the alternatives under consideration.



Exhibit 10-8

## SUMMARY OF SOCIOECONOMIC IMPACTS BY ALTERNATIVE

Parameter	Alternative 1 (No Action)	Alternative 2	Alternative 3 (Preferred)	Alternative 4	Alternative 5	Alternative 6 (Preferred)
Number of Heavily Affected Vessels	0	219	219	219	2	219
Total Employment on Heavily Affected Vessels	N.A.	379	379	379	3	379
Impacts on Dealers	- Status quo; no additional impact	- Minor	- Minor	- Minor	- Minor	- Minor
Impacts on Processors	- Status quo; no additional impact	- Minor	- Minor	- Minor	- Minor	- Minor
Other Potential Negative Social Impacts	- Status quo; no additional impact	- Competition for fishing grounds in exempted waters - Safety and time implications of gear loss - Burden greatest on small vessels; potential industry consolidation	- Competition for fishing grounds in exempted waters - Safety and time implications of gear loss - Burden greatest on small vessels; potential industry consolidation	- Competition for fishing grounds in exempted waters - Safety and time implications of gear loss - Burden greatest on small vessels; potential industry consolidation	- Minor	- Competition for fishing grounds in exempted waters - Safety and time implications of gear loss - Burden greatest on small vessels; potential industry consolidation
Positive Social Impacts	- Status quo; no additional impact	- Removal of DAM program may increase safety of and lessen burden on fishermen - Public welfare benefits of increased whale protection (greatest benefit relative to other alternatives)	- Removal of DAM program may increase safety of and lessen burden on fishermen - Public welfare benefits of increased whale protection (slightly lesser benefit relative to Alternative 2)	- Removal of DAM program may increase safety of and lessen burden on fishermen - Public welfare benefits of increased whale protection (slightly lesser benefit relative to Alternative 2).	- Removal of DAM program may increase safety of and lessen burden on fishermen - Public welfare benefits of increased whale protection (significantly lesser benefit relative to Alternative 2).	- Removal of DAM program may increase safety of and lessen burden on fishermen - Public welfare benefits of increased whale protection (slightly lesser benefit relative to Alternative 2).
Note: N.A = Not Applicable						

## **10.8 CUMULATIVE IMPACTS OF ALTERNATIVES**

NEPA requires all environmental impact statements for proposed Federal actions to include a cumulative effects analysis (CEA) that examines the impact of the actions in conjunction with other factors that affect the physical, biological, and socioeconomic resource components of the affected environment. The CEA produced for this EIS (see Chapter 9) examines the consequences of the regulatory alternatives within the context of past, present, and future factors that influence resources associated with the ALWTRP. The five valued ecosystem components addressed include: Atlantic large whales, other protected species, physical fishery resources, habitat, and fishing dependent communities. The sections below discuss the cumulative impact findings for each of these resources.

### **10.8.1 Atlantic Large Whales**

This VEC includes the three large whale species that are the focus of the ALWTRP — the North Atlantic right whale, the humpback whale, and the fin whale — as well as the minke whale, which also benefits from the plan. Exhibit 10-9 summarizes the risk factors affecting large whales and the major past, present, and reasonably foreseeable future actions (PRFFAs) influencing these risk factors. The impact of water pollution, noise pollution, climate change, or prey availability on whale mortality is generally uncertain.

With respect to known causes of whale mortality, the relative importance of different risk factors varies by species. In the case of right whales, entanglements and ship strikes remain of equal concern due to the critically endangered status of the species. For the three other large whale species, the relative impact of ship strikes and entanglements varies by species. Fin whales are more frequently killed by ship strikes than entanglements, while the opposite holds true for humpback and minke whales, who appear to be more susceptible to entanglements than ship strikes.

Past and present actions (e.g., whaling bans) have slowed the rapid decline of key whale species. The ALWTRP modifications considered here would reduce the risk of serious injury or mortality due to entanglement without exacerbating the risk associated with any of the remaining stressors. Therefore, all regulatory alternatives, excluding the no action alternative, are expected to have an overall positive cumulative effect on large whale survival. Exhibit 10-10 presents a more detailed analysis by alternative.

### **10.8.2 Other Protected Species**

Other protected species include whale, porpoise, dolphin, seal, and sea turtle species that may interact with gillnet and/or trap/pot fishing gear, and are classified as (1) endangered or threatened under the Endangered Species Act, or (2) in the case of some dolphin species, strategic stocks under the Marine Mammal Protection Act.

**Exhibit 10-9****SUMMARY OF FACTORS AFFECTING ATLANTIC LARGE WHALES**

<b>Risk Factor</b>	<b>Degree of Certainty</b>	<b>Current Magnitude of Impact</b>	<b>Major Past, Present, and Reasonably Foreseeable Future (PRFFAs) Management Actions</b>	<b>Effect of PRFFAs</b>
Whaling	Known	Low to High <sup>1</sup> (depending on species)	All whaling of right whales was banned in 1935; in 1955 for humpback whales; in 1986 for fin whales and minke whales (although whaling of fin and minke whales continues).	Reduced whaling
Entanglement	Known	High	The initial ALWTRP went into effect in 1997 as an Interim Final Rule. This rule was updated in February 1999, December 2000, January 2002, and August 2003. Additional non-regulatory initiatives include gear research and development; the disentanglement network; and the right whale sighting advisory system.	Reduced entanglement risk
Ship Strikes	Known	High	The Mandatory Ship Reporting System was implemented in July 1999 to provide real-time right whale sighting information to vessel operators. In 1994, NMFS convened a Ship Strike Committee which submitted its recommendations to NMFS in 2001. NMFS developed a proposed Strategy to Reduce Ship Strikes of Right Whales and published an Advance Notice of Proposed Rulemaking (69 FR 30857) to solicit comments on proposed operational measures for the shipping industry contained within the Strategy.	Reduced mortality and injury from ship strikes
Water Pollution	Suspected	Uncertain	Regulations exist to control water pollution at both the national and international level, including the CWA, CZMA, MPRSA, OPA, and the MARPOL 73/78 Convention.	Positive, however, the direct effect is uncertain.
Noise Pollution	Suspected	Moderate	In 1995, NMFS formed the Acoustics Program to coordinate and integrate NMFS acoustics policy with the small take program, scientific research permits, and other NMFS protected species programmatic functions.	Positive, however, the direct effect is uncertain.
Climate Change	Uncertain	Uncertain	International emissions reduction treaties; extensive research effort on climate change.	Positive, however, the direct effect is uncertain.
Prey Availability	Uncertain	Uncertain	FMP actions to ensure sustainable harvest and prevent overfishing of herring and mackerel.	Positive, however, the direct effect is uncertain.

**Notes:**

<sup>1</sup> Based on the lack of information on the minke and fin whale populations off of Greenland, including the status of these populations, the takes of these species in this area are considered moderate to high. The IWC has expressed concern that safe catch limits for these populations are not currently available.

The ALWTRP modifications considered in this EIS would complement existing and forthcoming actions to reduce takes of other protected species. Hence, the cumulative effect of all regulatory alternatives, excluding the no action alternative, is expected to be slightly positive to positive. Exhibit 10-11 presents a more detailed analysis by alternative.

## Exhibit 10-10

## VALUED ECOSYSTEM COMPONENT: ATLANTIC LARGE WHALES

Alternative	Direct and Indirect Impacts	Past and Present Actions, Including Other Federal and Non-Federal Actions	Reasonably Foreseeable Future Actions (RFFAs)	Cumulative Effects Associated with ALWTRP Modifications
Alternative 1 (No Action)	See section 5.1	<ul style="list-style-type: none"> <li>• <b>ALWTRP Rule:</b> The ALWTRP implemented gear modifications on the lobster trap/pot and gillnet fisheries to reduce incidental entanglement of Atlantic large whales in fishing gear. The initial rule went into effect in 1997; since then it has been updated in February 1999, December 2000, January 2002, and January 2003. This rule has resulted in positive effects from the implementation of low-risk gear modifications and seasonal closures where there is significant interaction between whales and lobster trap/pot and gillnet activity.</li> <li>• <b>Fishery Management Actions:</b> Positive effects have also resulted from the implementation of various management actions for fisheries that interact with Atlantic large whales. Reductions in entanglement risk have indirectly resulted from measures such as effort reductions; closures; and days-at-sea and trip limitations.</li> <li>• <b>Other Actions:</b> Whaling bans, water quality regulations.</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Fishery Management Actions:</b> Same as past and present actions.</li> <li>• <b>Other Potential Actions:</b> Management efforts to reduce incidental takes of right whales from ship strikes.</li> </ul>	<b>Neutral cumulative effect.</b>
Alternative 2	See section 5.1			<b>Positive cumulative effects.</b> Alternative 2 would implement broad-based gear modification requirements on a year-round basis in all areas subject to the ALWTRP. These requirements are designed to reduce whale entanglement risks. Based on current understanding of the seasonal distribution of whale stocks, the year-round approach might achieve little incremental risk reduction relative to the seasonal approach embodied in other alternatives, and thus would be highly risk averse.
Alternative 3 (Preferred)	See section 5.1			<b>Positive cumulative effects.</b> Alternative 3 (Preferred) would implement broad-based gear modification requirements on a year-round basis in the Northeast and on a seasonal basis in the Southeast and Mid-Atlantic, based on current understanding of the seasonal distribution of whale stocks. This alternative would reduce entanglement risks, but is not as risk averse as Alternative 2. Available data on whale sightings suggest that the practical benefits of this approach may be as great as those that would be achieved under coast-wide year-round standards.
Alternative 4	See section 5.1			<b>Positive cumulative effects.</b> Alternative 4 would implement broad-based gear modification requirements on a year-round basis in the Northeast and Mid-Atlantic, and on a seasonal basis in the Southeast. Based on current understanding of the seasonal distribution of whale stocks, this approach would be more conservative than Alternative 3, but not as risk averse as Alternative 2.
Alternative 5	See section 5.1			<b>Positive cumulative effects.</b> Alternative 5 focuses on expanding the provisions of the existing SAM program and thus differs significantly from the other alternatives. Boundaries for the SAM zone would be revised, and all vessels fishing in SAM waters would be required to use non-floating line in all groundline and in the upper two-thirds of all buoy lines. These requirements and the SAM program would continue indefinitely. This alternative, however, would not expand broad-based gear modification requirements outside the SAM zone. As a result, the benefits of Alternative 5 for Atlantic large whales would likely be significantly lower than the benefits derived from all other alternatives.
Alternative 6 (Preferred)	See section 5.1			<b>Positive cumulative effects.</b> Alternative 6 (Preferred) blends the broad-based seasonal gear modification requirements specified under Alternative 3 with the expanded SAM program specified under Alternative 5. The implementation of broad-based seasonal gear modification requirements would reduce entanglement risks in Atlantic waters when the potential for interactions between ALWTRP-regulated fisheries and Atlantic large whales is greatest. The expanded SAM program would provide additional protection between the effective date of the plan and 2008, when the broad-based gear modification requirements would take effect.

## Exhibit 10-11

## VALUED ECOSYSTEM COMPONENT: OTHER PROTECTED SPECIES

Alternative	Direct and Indirect Impacts	Past and Present Actions, Including Other Federal and Non-Federal Actions	Reasonably Foreseeable Future Actions (RFFAs)	Cumulative Effects Associated with ALWTRP Modifications
Alternative 1 (No Action)	See section 5.2.1	<ul style="list-style-type: none"> <li>• <b>AOCTRT:</b> Positive effects from the reduction of entanglement risks implemented through the HMS FMP.</li> <li>• <b>ALWTRP Rules:</b> The ALWTRP has implemented gear modifications for the lobster trap/pot and gillnet fisheries to reduce incidental entanglement of specific Atlantic large whales in fishing gear; this rule also provides the same benefits to other large whale species' whose ranges overlap the ALWTRP area.</li> <li>• <b>HPTRP:</b> Positive effects from the implementation of area restrictions on gillnet activity from the Gulf of Maine to the Mid-Atlantic region.</li> <li>• <b>Turtle Excluder Devices:</b> Positive effects from the reduction of entanglement risk from shrimp trawling operations.</li> <li>• <b>VA Pound Net Rule:</b> This rule enacted seasonal area and gear restrictions designed to reduce the entanglement of sea turtles in the state fishery.</li> <li>• <b>Fishery Management Actions:</b> Positive effects have also resulted from the implementation of various management actions for fisheries that interact with protected species. Reductions in entanglement risk have indirectly resulted from measures such as time/area closures and effort reductions (e.g., days-at-sea allocations, trip limits). Also recent hook, bait, and sea turtle release gear requirements for pelagic longline fisheries.</li> </ul>	<ul style="list-style-type: none"> <li>• <b>BDTRP:</b> A proposed rule to implement the BDTRP is anticipated in 2004; designed to reduce incidental takes in the Mid- and South Atlantic regions.</li> <li>• <b>Atlantic Trawl and Longline Take Reduction Teams:</b> In 2005 and 2006, new teams will be developed to reduce the incidental take of strategic stocks of protected species in these fisheries.</li> <li>• <b>Sea Turtle Strategic Plan:</b> Released by NMFS in June 2001, the plan will address the incidental capture of five sea turtle species in state and Federal fisheries in the Atlantic and Gulf of Mexico.</li> <li>• <b>Fishery Management Actions:</b> Same as past and present actions.</li> </ul>	<b>Neutral cumulative effect.</b>
Alternative 2	See section 5.2.1			<b>Positive cumulative effects.</b> Broad-based groundline, buoy line, and net anchoring requirements would be implemented year-round in all ALWTRP areas under Alternative 2, with ancillary reductions in entanglement risks for sea turtles, harbor porpoises, and bottlenose dolphins.
Alternative 3 (Preferred)	See section 5.2.1			<b>Positive cumulative effects.</b> Broad-based groundline, buoy line, and net anchoring requirements would be implemented year-round north of 40 degrees N latitude, and on a seasonal basis elsewhere; as a result, this alternative would likely provide fewer ancillary benefits to sea turtles and bottlenose dolphins in Mid-Atlantic and Southeast waters than would Alternatives 2 or 4.
Alternative 4	See section 5.2.1			<b>Positive cumulative effects.</b> Broad-based groundline, buoy line, and net anchoring requirements would be implemented year-round north of the SC/GA border, and on a seasonal basis in the Southeast. Although this alternative would provide greater ancillary benefits to sea turtles and bottlenose dolphins in Mid-Atlantic waters than would Alternatives 3 (Preferred), 5, and 6 (Preferred), it would provide less protection in the Southeast than would Alternative 2.
Alternative 5	See section 5.2.1			<b>Slightly positive cumulative effects.</b> Extension of SAM groundline and buoy line requirements to additional fisheries and expansion of the SAM program to new areas could help reduce entanglement risks for sea turtles and harbor porpoises in Northeast waters. Alternative 5, however, would not impose broad-based groundline, buoy line, and net anchoring requirements in other areas; as a result, the ancillary benefits associated with these requirements, either on a seasonal or year-round basis, would not be realized.
Alternative 6 (Preferred)	See section 5.2.1			<b>Positive cumulative effects.</b> Broad-based groundline, buoy line, and net anchoring requirements would be implemented year-round north of 40 degrees N latitude, and on a seasonal basis elsewhere; as a result, this alternative would likely provide fewer ancillary benefits to sea turtles and bottlenose dolphins in Mid-Atlantic and Southeast waters than would Alternatives 2 or 4. Expansion of the SAM area and extension of the SAM program to additional fisheries in 2008 could provide ancillary benefits to other protected species in Northeast waters.

### **10.8.3 Habitat**

The habitat VEC includes all marine habitats deemed essential and/or critical to the well-being and reproduction of commercial marine species and endangered species. The ALWTRP modifications considered here are likely to have no significant, long-term impact on habitat. However, the potential action could contribute to increased contact between fishing gear (i.e., groundline and anchors) and the ocean floor, and could result in adverse impacts on habitat in exempted areas where fishing pressure may intensify. Therefore, the cumulative effects of Alternatives 2, 3 (Preferred), 4, 5, and 6 (Preferred) are expected to be slightly negative. Exhibit 10-12 presents a more detailed analysis by alternative.

### **10.8.4 Affected Fisheries**

The affected fisheries are all those currently or potentially subject to the requirements of the ALWTRP. The potential modifications to the ALWTRP are likely to have no significant, long-term impact on affected fishery resources (e.g., the American lobster resource, groundfish resources, etc.). Therefore, no cumulative effects are identified for any of the regulatory alternatives (Exhibit 10-13).

### **10.8.5 Fishing Dependent Communities**

This VEC includes all coastal communities whose economies and social structure are substantially dependent on or affected by lobster, other trap/pot, and/or gillnet fishing activities and income.

The cumulative impacts for fishing dependent communities are a function of current and forthcoming management actions, as well as the incremental impacts of the ALWTRP modification. While the regulatory changes specified under Alternative 5 would be unlikely to have significant economic or social impacts, the regulatory changes specified under Alternatives 2, 3 (Preferred), 4, and 6 (Preferred) would likely have more significant effects. In the case of these alternatives, the impacts on fishing-dependent communities would vary by fishery. The greatest socioeconomic pressure would likely be felt by those in the lobster trap/pot fishery, particularly those who operate small lobster vessels; compliance costs for these fishermen are likely to represent a greater share of total revenues than would be the case for most others. The economic burden associated with these costs would be felt by small-boat lobstermen and their families in numerous communities along the Northeast Atlantic coast, and could force some individuals to leave the industry. At the community level, however, broad-scale socioeconomic dislocation is unlikely; the most acutely affected segments of the lobster trap/pot fishery account for a relatively small share of total employment in the commercial fishing industry, and the effects on employment, if any, are not likely to be concentrated in any one port.

## Exhibit 10-12

## VALUED ECOSYSTEM COMPONENT: HABITAT

Alternative	Direct and Indirect Impacts	Past and Present Actions, Including Other Federal and Non-Federal Actions	Reasonably Foreseeable Future Actions (RFFAs)	Cumulative Effects Associated with ALWTRP Modifications
Alternative 1 (No Action)	See section 5.2.2	<ul style="list-style-type: none"> <li>• <b>External Management Actions:</b> <ul style="list-style-type: none"> <li>– Clean Water Act;</li> <li>– CZMA of 1972;</li> <li>– MPRSA of 1972;</li> <li>– OPA of 1990; and</li> <li>– International laws regarding marine pollution.</li> </ul> </li> <li>• <b>International Management Actions:</b> Determinations or regulations that have been enacted by NMFS or the Councils that clearly benefit EFH, such as essential fish habitat designations; area closures; gear and crew restrictions/alterations; permitting restrictions; and effort reductions (e.g., days-at-sea allocations, trip limits).</li> </ul>	<ul style="list-style-type: none"> <li>• <b>EFH Review:</b> The NEFMC and the SAFMC will be reviewing and revising the EFH component of all FMPs under their authority in the near future.</li> <li>• <b>International Management Actions:</b> Same as past and present actions.</li> </ul>	<b>Neutral cumulative effect.</b>
Alternative 2	See section 5.2.2			<b>Slightly negative cumulative effect.</b> Negative effects are anticipated as a result of increased contact between fishing gear (i.e., groundline and anchors) and the ocean floor, but these effects are expected to be minimal. Alternative 2 would result in installation of the greatest amount of non-floating groundline; therefore, in comparison with all alternatives except Alternative 1, this alternative would be expected to have the greatest adverse impact on habitat. In addition, a potential increase in fishing pressure in exempted areas could have an adverse impact on the benthic environment there. This alternative would have no impact on the continuing negative effect of other fishing and non-fishing activities.
Alternative 3 (Preferred)	See section 5.2.2			<b>Slightly negative cumulative effect.</b> Negative effects are anticipated as a result of increased contact between fishing gear (i.e., groundline and anchors) and the ocean floor, but these effects are expected to be minimal. Alternative 3 (Preferred) would result in the installation of slightly less non-floating groundline than would Alternatives 2 and 4; therefore, in comparison to these alternatives, Alternative 3 (Preferred) would be expected to have a slightly lower impact on habitat. In addition, a potential increase in fishing pressure in exempted areas could have an adverse impact on the benthic environment there. This alternative would have no impact on the continuing negative effect of other fishing and non-fishing activities.
Alternative 4	See section 5.2.2			<b>Slightly negative cumulative effect.</b> Negative effects are anticipated as a result of increased contact between fishing gear (i.e., groundline and anchors) and the ocean floor, but these effects are expected to be minimal. Alternative 4 would result in installation of the same amount of non-floating groundline as would Alternative 2. In addition, a potential increase in fishing pressure in exempted areas could have an adverse impact on the benthic environment there. This alternative would have no impact on the continuing negative effect of other fishing and non-fishing activities.
Alternative 5	See section 5.2.2			<b>Slightly negative cumulative effect.</b> Alternative 5 would not impose a broad-based requirement for the use of non-floating groundline; therefore, in comparison to Alternatives 2, 3 (Preferred), 4, and 6 (Preferred), this alternative is expected to have less impact on benthic habitat. Negative effects are anticipated, however, as a result of extension of SAM anchoring and groundline requirements to additional areas. In addition, a potential increase in fishing pressure in exempted areas could have an adverse impact on the benthic environment there. This alternative would have no impact on the continuing negative effect of other fishing and non-fishing activities.
Alternative 6 (Preferred)	See section 5.2.2			<b>Slightly negative cumulative effect.</b> Negative effects are anticipated as a result of increased contact between fishing gear (i.e., groundline and anchors) and the ocean floor, but these effects are expected to be minimal. Alternative 6 (Preferred) would result in the installation of a slightly smaller amount of non-floating groundline than would Alternatives 2 and 4; therefore in comparison to these alternatives, Alternative 6 (Preferred) would be expected to have a slightly lower impact on habitat. In addition, a potential increase in fishing pressure in exempted areas could have an adverse impact on the benthic environment there. This alternative would have no impact on the continuing negative effect of other fishing and non-fishing activities.

## Exhibit 10-13

## VALUED ECOSYSTEM COMPONENT: FISHERY RESOURCES

Alternative	Direct and Indirect Impacts	Past and Present Actions, Including Other Federal and Non-Federal Actions	Reasonably Foreseeable Future Actions (RFFAs)	Cumulative Effects Associated with ALWTRP Modifications
Lobster Trap/Pot Fishery				
Alternative 1 (No Action)	See section 5.2.3	<ul style="list-style-type: none"><li><b>Fishery Management Actions:</b> Significant recent actions include Amendment 3, trap reductions for all LMAs under Addendum I, and effort reductions in LMA 2 under Addendum IV. These actions are designed to improve fishery resource stocks.</li><li><b>ALWTRP:</b> Gear restrictions and area closures under the current ALWTRP.</li></ul>	<ul style="list-style-type: none"><li><b>Sea Turtle Strategic Plan:</b> Lobster trap/pot fishery could be subject to regulations under this plan.</li><li><b>Fishery Management Actions:</b> Addendum V, approved March 2004, implements a trap cap for LMA 3. State management programs must have regulations to implement the LMA 3 program by June 1, 2005. In addition, it is expected that ongoing fishery management actions will occur until fishery resources are not designated as “overfishing” or “overfished” under the SFA.</li></ul>	Neutral cumulative effect
Alternative 2	See section 5.2.3			None identified
Alternative 3 (Preferred)	See section 5.2.3			None identified
Alternative 4	See section 5.2.3			None identified
Alternative 5	See section 5.2.3			None identified
Alternative 6 (Preferred)	See section 5.2.3			None identified
Gillnet Fisheries				
Alternative 1 (No Action)	See section 5.2.3	<ul style="list-style-type: none"><li><b>Fishery Management Actions:</b> Measures implemented under FMPs, including DAS reductions for the Northeast multispecies, monkfish, and spiny dogfish fisheries, and harvest quotas for the shark and coastal migratory pelagic species fisheries. These actions are designed to improve fishery resource stocks.</li><li><b>HPTRP:</b> Area restrictions under the HPTRP apply to the following fisheries: Northeast multispecies, monkfish, and spiny dogfish.</li><li><b>ALWTRP:</b> Gear restrictions and area closures under the current ALWTRP, excluding the Northeast anchored float gillnet and the Northeast driftnet fisheries.</li></ul>	<ul style="list-style-type: none"><li><b>Amendment 2:</b> In development; measures to incorporate updated scientific information into monkfish FMP.</li><li><b>Sea Turtle Strategic Plan:</b> Fisheries that could be subject to regulations under this plan include Northeast multispecies, monkfish, and spiny dogfish.</li><li><b>BDTRP:</b> Fisheries that could be subject to regulations under this plan include Northeast multispecies, monkfish, and spiny dogfish.</li><li><b>Fishery Management Actions:</b> It is expected that ongoing fishery management actions will occur until fishery resources are not designated as “overfishing” or “overfished” under the SFA.</li></ul>	Neutral cumulative effect
Alternative 2	See section 5.2.3			None identified
Alternative 3 (Preferred)	See section 5.2.3			None identified
Alternative 4	See section 5.2.3			None identified
Alternative 5	See section 5.2.3			None identified
Alternative 6 (Preferred)	See section 5.2.3			None identified
Other Trap/Pot Fisheries				
Alternative 1 (No Action)	See section 5.2.3	<ul style="list-style-type: none"><li><b>Fishery Management Actions:</b> Measures implemented under FMPs, including harvest quotas for black sea bass, scup, and red crab. These actions are designed to improve fishery resource stocks.</li><li><b>HPTRP:</b> Area restrictions under the HPTRP for the northern black sea bass fishery.</li><li><b>ALWTRP:</b> Gear restrictions and area closures under the current ALWTRP for the red crab fishery.</li></ul>	<ul style="list-style-type: none"><li><b>Amendment 13b:</b> In development; measures to reduce southern black sea bass fishing effort.</li><li><b>Sea Turtle Strategic Plan:</b> Fisheries that could be subject to regulations under this plan include black sea bass.</li><li><b>Fishery Management Actions:</b> It is expected that ongoing fishery management actions will occur until fishery resources are not designated as “overfishing” or “overfished” under the SFA.</li><li><b>FMPs:</b> An increase in fishing pressure on the following fisheries, not currently regulated under the SFA, could result in Federal regulation: hagfish, Jonah crab, and conch/whelk.</li></ul>	Neutral cumulative effect
Alternative 2	See section 5.2.3			None identified
Alternative 3 (Preferred)	See section 5.2.3			None identified
Alternative 4	See section 5.2.3			None identified
Alternative 5	See section 5.2.3			None identified
Alternative 6 (Preferred)	See section 5.2.3			None identified



In the case of the multispecies, monkfish, dogfish, shark, and coastal migratory pelagic fisheries, the effect of potential modifications to the ALWTRP would likely be minor, but adds to significant socioeconomic pressure from existing or anticipated actions, yielding slightly negative cumulative effects overall. Finally, some segments of the northern black sea bass and hagfish fisheries could be adversely affected by potential revisions to the ALWTRP, but the fishing fleets are small, making community-level impacts unlikely.

Exhibit 10-14 presents a more detailed analysis by alternative for the lobster trap/pot fishery, the other trap/pot fishery, and the gillnet fishery.

## **10.9 OVERALL BENEFIT-COST RESULTS**

All of the alternatives are superior to the no action alternative (Alternative 1) in terms of the relative balance of benefits and costs.

For the remaining alternatives (2 through 6), development of a unifying cost-benefit comparison is complicated by several factors. First, the costs and benefits are characterized using diverse metrics (e.g., dollars, increased use of low-risk gear, numbers of heavily affected vessels) that cannot be readily merged into a single measure. Second, the benefits are predicated on the improved conservation of whales; however, it is analytically infeasible to estimate the marginal number of whales that would be saved each year by the ALWTRP modifications. Finally, as acknowledged above, several of the regulatory alternatives – Alternatives 2, 3, 4, and 6 – have very similar implications; the minor variations that exist between these alternatives do not allow easy differentiation.

Differentiating among the alternatives therefore requires careful, critical consideration of the cost and benefit estimates developed. Because it would require year-round use of low-risk gear along the entire Atlantic coast, Alternative 2 clearly is the most conservative, risk-averse approach to the protection of endangered whales. However, the seasonal exemptions provided under Alternatives 3, 4, and 6 are premised on the movement of whales. Therefore, the residual potential for entanglement of whales in mid-Atlantic or south Atlantic waters during summer months is minor; i.e., year-round requirements offer little marginal risk reduction benefit. Likewise, the use and non-use benefits associated with these alternatives vary little.

## Exhibit 10-14

## VALUED ECOSYSTEM COMPONENT: FISHING DEPENDENT COMMUNITIES

Alternative	Direct and Indirect Impacts	Past and Present Actions, Including Other Federal and Non-Federal Actions	Reasonably Foreseeable Future Actions (RFFAs)	Cumulative Effects Associated with ALWTRP Modifications
<b>Lobster Trap/Pot Fishery</b>				
Alternative 1 (No Action)	No change.	<ul style="list-style-type: none"> <li><b>Fishery Management Actions:</b> Significant recent actions include Amendment 3, trap reductions for all LMAs under Addendum I, and effort reductions in LMA 2 under Addendum IV. These actions are designed to improve fishery resource stocks and have resulted in slightly negative economic and social impacts on regulated lobster fishermen and communities.</li> <li><b>ALWTRP:</b> Gear restrictions and area closures under the current ALWTRP. Resulted in slightly negative economic and social impacts on vessels fishing in Critical Habitat Areas (especially Cape Cod Bay from January 1 – May 15), and SAM areas.</li> </ul> <p><b>Heavily impacted communities:</b></p> <ul style="list-style-type: none"> <li><b>LMA 2</b> as a result of the mass mortality of lobster in LIS (1999).</li> </ul>	<ul style="list-style-type: none"> <li><b>Sea Turtle Strategic Plan:</b> Lobster trap/pot fishery could be subject to regulations under this plan.</li> <li><b>Fishery Management Actions:</b> Addendum V, approved March 2004, implements a trap cap for LMA 3. State management programs must have regulations to implement the LMA 3 program by June 1, 2005. In addition, it is expected that ongoing fishery management actions will occur until fishery resources are not designated as “overfishing” or “overfished” under the SFA.</li> </ul>	<b>Neutral cumulative effect.</b>
Alternative 2	Heavily affected vessels include: <ul style="list-style-type: none"> <li>Class I vessels in Offshore, Southern Nearshore, and Maine state waters; and</li> <li>Class I and II vessels in LMA 6.</li> </ul>			<b>Slightly negative cumulative effects</b> for most vessels under Alternatives 2, 3 (Preferred), and 4. There is little difference in economic and social impacts among these alternatives because all three impose year-round gear modification requirements north of 40 degrees N latitude, where the lobster trap/pot fishery is concentrated.
Alternative 3 (Preferred)				
Alternative 4				
Alternative 5	Heavily affected vessels include Class II vessels newly regulated in Offshore SAM waters.			<b>Neutral cumulative effects.</b> The economic and social impacts of Alternative 5 are a fraction of the impacts estimated for Alternatives 2, 3 (Preferred), 4, and 6 (Preferred). Heavily-affected vessels are limited to one to two Class I vessels that become newly regulated under the SAM program in Offshore waters.
Alternative 6 (Preferred)	Heavily affected vessels under Alternative 6 (Preferred) are the same as under Alternatives 2, 3 (Preferred), and 4.			<b>Slightly negative cumulative effects.</b> The estimated economic and social impacts of Alternative 6 (Preferred) are slightly less but essentially equal to those estimated under Alternatives 2, 3 (Preferred), and 4.

## Exhibit 10-14

## VALUED ECOSYSTEM COMPONENT: FISHING DEPENDENT COMMUNITIES

Alternative	Direct and Indirect Impacts	Past and Present Actions, Including Other Federal and Non-Federal Actions	Reasonably Foreseeable Future Actions (RFFAs)	Cumulative Effects Associated with ALWTRP Modifications
<b>Gillnet Fisheries</b>				
Alternative 1 (No Action)	No change.	<ul style="list-style-type: none"> <li><b>Fishery Management Actions:</b> Measures implemented under FMPs, including DAS reductions for the Northeast multispecies, monkfish, and spiny dogfish fisheries, and harvest quotas for the shark and coastal migratory pelagic species fisheries. These actions are designed to improve fishery resource stocks.</li> <li><b>HPTRP:</b> Area restrictions under the HPTRP apply to the following fisheries: Northeast multispecies, monkfish, and spiny dogfish.</li> <li><b>ALWTRP:</b> Gear restrictions and area closures under the current ALWTRP, excluding the Northeast anchored float gillnet and the Northeast driftnet fisheries.</li> </ul>	<ul style="list-style-type: none"> <li><b>Amendment 2:</b> In development; measures to incorporate updated scientific information into monkfish FMP.</li> <li><b>Sea Turtle Strategic Plan:</b> Fisheries that could be subject to regulations under this plan include Northeast multispecies, monkfish, and spiny dogfish.</li> <li><b>BDTRP:</b> Fisheries that could be subject to regulations under this plan include Northeast multispecies, monkfish, and spiny dogfish.</li> <li><b>Fishery Management Actions:</b> It is expected that ongoing fishery management actions will occur until fishery resources are not designated as “overfishing” or “overfished” under the SFA.</li> </ul>	<b>Neutral cumulative effect.</b>
Alternative 2	No heavily affected vessels identified.			<b>Slightly negative cumulative effects.</b> The social impact assessment identified 28 to 29 at-risk vessels under all three alternatives (i.e., annual compliance costs represent 5 to 15 percent of annual revenues). Most of these vessels are in the Mid-Atlantic anchored gillnet fishery. No other vessels are expected to incur compliance costs greater than five percent of estimated revenues. However, all of the gillnet fisheries are subject to numerous regulations that have resulted in highly adverse impacts for the Northeast multispecies fishery, as well as adverse impacts for the monkfish, spiny dogfish, shark, and coastal migratory pelagic species fisheries. Therefore, the cumulative effects are expected to be slightly negative.
Alternative 3 (Preferred)				
Alternative 4				
Alternative 5	No heavily affected vessels identified.			<b>Slightly negative to neutral cumulative effects.</b> The social impact assessment for Alternative 5 found no gillnet vessels at risk. However, all of the gillnet fisheries are subject to numerous regulations that have resulted in highly adverse impacts for the Northeast multispecies fishery, as well as adverse impacts for the monkfish, spiny dogfish, shark, and coastal migratory pelagic species fisheries. Therefore, the cumulative effects are expected to be slightly negative for some portions of the gillnet fishery and neutral in others.
Alternative 6 (Preferred)	No heavily affected vessels identified.			<b>Slightly negative cumulative effects.</b> The social impact assessment identified 28 to 29 at-risk vessels under all three alternatives (i.e., annual compliance costs represent 5 to 15 percent of annual revenues). Most of these vessels are in the Mid-Atlantic anchored gillnet fishery. No other vessels are expected to incur compliance costs greater than five percent of estimated revenues. However, all of the gillnet fisheries are subject to numerous regulations that have resulted in highly adverse impacts for the Northeast multispecies fishery, as well as adverse impacts for the monkfish, spiny dogfish, shark, and coastal migratory pelagic species fisheries. Therefore, the cumulative effects are expected to be slightly negative.

Exhibit 10-14				
VALUED ECOSYSTEM COMPONENT: FISHING DEPENDENT COMMUNITIES				
Alternative	Direct and Indirect Impacts	Past and Present Actions, Including Other Federal and Non-Federal Actions	Reasonably Foreseeable Future Actions (RFFAs)	Cumulative Effects Associated with ALWTRP Modifications
<b>Other Trap/Pot Fisheries</b>				
Alternative 1 (No Action)	No change.	<ul style="list-style-type: none"> <li>• <b>Fishery Management Actions:</b> Measures implemented under FMPs including harvest quotas for black sea bass, scup, and red crab. These actions are designed to improve fishery resource stocks and have resulted in slightly negative economic and social impacts on regulated fishermen and communities.</li> <li>• <b>HPTRP:</b> Area restrictions under the HPTRP for the northern black sea bass fishery.</li> <li>• <b>ALWTRP:</b> Gear restrictions and area closures under the current ALWTRP for the red crab fishery.</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Amendment 13b:</b> In development; measures to reduce southern black sea bass fishing effort.</li> <li>• <b>Sea Turtle Strategic Plan:</b> Fisheries that could be subject to regulations under this plan include black sea bass.</li> <li>• <b>Fishery Management Actions:</b> It is expected that ongoing fishery management actions will occur until fishery resources are not designated as “overfishing” or “overfished” under the SFA.</li> <li>• <b>FMPs:</b> An increase in fishing pressures on the following fisheries, not currently regulated under SFA, could result in Federal regulation: hagfish, Jonah crab, and conch/whelk.</li> </ul>	<b>Neutral cumulative effect.</b>
Alternative 2	Heavily affected vessels include: <ul style="list-style-type: none"> <li>• Black sea bass Class I and II vessels in Southern and Mid-Atlantic Nearshore waters; and</li> <li>• Hagfish Class II vessels in Northern Nearshore waters.</li> </ul>			<p><b>Slightly negative cumulative effects</b> for most fisheries under Alternatives 2, 3 (Preferred), and 4.</p> <p><b>Negative cumulative effects</b> for the black sea bass and hagfish fisheries. For black sea bass, this action is in addition to harvest quotas already implemented; for hagfish, this represents the first piece of significant Federal regulation. As a result, negative cumulative effects are expected for both fisheries.</p>
Alternative 3 (Preferred)				
Alternative 4				
Alternative 5	Estimates of annual compliance costs do not exceed 3.5 percent of estimated annual revenues for any class of vessel.			<b>Slightly negative cumulative effects</b> for most fisheries.
Alternative 6 (Preferred)	Heavily affected vessels include: <ul style="list-style-type: none"> <li>• Black sea bass Class I and II vessels in Southern and Mid-Atlantic Nearshore waters; and</li> <li>• Hagfish Class II vessels in Northern Nearshore waters.</li> </ul>			<p><b>Slightly negative cumulative effects</b> for most fisheries.</p> <p><b>Negative cumulative effects</b> for the black sea bass and hagfish fisheries. For black sea bass, this action is in addition to harvest quotas already implemented; for hagfish, this represents the first piece of significant Federal regulation. As a result, negative cumulative effects are expected for both fisheries.</p>

Furthermore, close examination of the compliance cost estimates suggests that the costs associated with the seasonal implementation of gear conversion requirements may be over-estimated. The analysis posits that fishermen will convert gear even if the requirements only apply in certain months, a very conservative assumption. According to comments provided by fishermen during the scoping process, many fishermen in the mid- and south Atlantic use separate sets of gear to target different species at different times of year. If conversion of only winter gear is required, compliance costs will be less than those estimated. In addition, some of the fishermen in the mid-Atlantic and south Atlantic areas may choose to confine their fishing effort to months when the requirements are not in effect, avoiding the regulation completely. Such behavior would reduce the cost of complying with Alternatives 3, 4, and 6 without increasing risk to whales.

Based on consideration of the relative costs and benefits of the alternatives, NMFS has selected Alternatives 3 and 6 as its preferred alternatives. These alternatives offer the flexibility of seasonal restrictions for both the mid- and south Atlantic regions, potentially allowing fishermen to pursue lower-cost compliance strategies. The risk-reduction tradeoff is minimal, given that entanglement risk in the mid- and south Atlantic is low in the summer months (due to whale migratory patterns). Alternative 6 offers the added protectiveness of temporarily expanding the SAM zone; while the SAM requirements would eventually be eliminated, they would remain in effect until the broad-based gear modifications are fully implemented in 2008.

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